1841
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THE

# JOURNAL OF BOTANY;

CONTAINING

## FIGURES AND DESCRIPTIONS

OF

SUCH PLANTS AS RECOMMEND THEMSELVES BY THEIR NOVELTY, RARITY, HISTORY, OR USES;

TOGETHER WITH

## BOTANICAL NOTICES AND INFORMATION,

AND

## OCCASIONAL PORTRAITS AND MEMOIRS OF EMINENT BOTANISTS;

BY

SIR W. J. HOOKER, K.H., LL.D, F.R, A., & L.S.,
ETC., ETC., ETC.
AND REGIUS PROFESSOR OF BOTANY IN THE UNIVERSITY OF GLASGOW.

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MISSOURI BOTANICAL GARDEN
RECEIVED

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# JOURNAL OF BOTANY.

I.—*Report of* M. GUILLEMIN, Botanical Assistant at the Museum of Natural History, *presented to the Minister of Agriculture and Commerce on the subject of the Expedition to Brazil, undertaken principally with the view to obtain information respecting the culture and preparation of the* TEA PLANT, *and the introduction of this Shrub into France.*

[*Translated and abridged from the French.**]

SIR,—I had the honour to receive your orders that I should proceed to Rio Janeiro, for the purpose of procuring seeds and growing plants of the *Tea*, in such quantities as should permit of this shrub being cultivated, as an experiment on a large scale, in different parts of France; and in order to promote my views, you further directed that M. Houlet, under-head-gardener at the hothouses of the Museum, should accompany me. The Minister of the Marine was requested to give M. Houlet and myself a passage in a ship of war, and the French Minister Plenipotentiary at the court of Brazil received instructions for despatching the chests which should contain the plants and seeds of *Tea*, in order that these should reach France about the month of June, 1839.

From time to time during my absence I have had the honour to communicate with you, and I now hasten to inform you that the cases of *Tea plants* have reached Paris, and that I shall be glad to receive your orders respecting their distribution and destination. I may mention, that during the short period which intervened between my sailing orders

* Inserted in the *Revue Agricole,* 16me livraison.

and final departure, I collected all the information in my power respecting the cultivation, preparation, and trade in Tea, as pursued in different parts of the world. M. Gaudichaud, who had visited most of the Tea countries, kindly gave me much advice, and so did the different Professors of the Museum, M. Brongniart and M. le Baron de Lessert, to the latter of whom I am indebted for letters of credit on his Brazilian correspondents. I also carefully collected the documents published by Dr Wallich of Calcutta on the *Assam* and *Javanese Tea.*

With the hope of gaining useful commercial and scientific information on the different valuable articles of Brazilian export, I obtained from M. Guibourt, Professor at the School of Pharmacy, a sheet full of questions respecting the woods used for building, for cabinet-work, and dyeing, the gums, resins, and balsams, &c. which are only known to us under their vernacular, and often barbarous appellations. Mr Ward's new plan for transporting living plants on board ship having been already tried with success by Dr Wallich, I procured from Brest one of these air-tight chests, sent by Dr W. and filled it with twenty-four of the finest varieties of *Camellia,* intending to make presents of these charming shrubs to those Brazilian individuals who should most facilitate the objects of my mission; and having sailed late in August, 1838, I reached Rio Janeiro after a passage of fifty-three days.

M. le Baron Rouen, French Minister Plenipotentiary, to whom I delivered, Sir, your official letters, confirmed what M. Gaudichaud had told me, and urged me to visit the Botanic Garden established near the Lake Freytas, and superintended by Dr Bernardo Josè de Serpa Brandao. To this gentleman I presented a portion of my *Camellias,* in acknowledgment of his kindness, and I only regretted that I had not brought any botanical or horticultural books, which I think he would have prized still more highly. Those of my *Camellias* which remained were sent to the Imperial Garden of St Christopher. M. de Serpa Brandao urged me to visit him frequently, and promised me every informa-

tion on the culture, mode of picking and preparing the Tea. As this shrub is grown in several plantations, about two days journey distant from Rio, in different directions, I hired a lodging at St Theresa, sufficiently contiguous to all the establishments I meant to visit, and farther recommended by having a small garden attached to the house, where I could deposit the growing plants of *Tea*, and sow seeds. During the month of November, except when hindered by slight indispositions incidental to the Brazilian climate, I pursued my researches, and principally in the charming vallies of the Tijuka and Gavia mountains, where, together with *Coffee*, their principal product, the most valuable plants of the equatorial region are cultivated.

In the middle of November I had an opportunity of observing the method pursued when culling the Tea, which is performed by black slaves, chiefly women and children. They carefully selected the tenderest and pale green leaves, nipping off with their nails the young leaf bud, just below where the first or second leaf was unfolded. One whole field had already undergone this operation; nothing but Tea shrubs stripped of their foliage remained. The inspector assured me that the plant receives no injury from this process, and that the harvest of leaves was to become permanent by carefully regulating it, so that the foliage should have grown again on the first-stripped shrubs at the period when the leaves of the last plants were pulled off. About 12,000 Tea shrubs are grown in this garden; they are regularly planted in quincunxes, and stand about one metre distant from each other; the greater number are stunted and shabby looking, probably owing to the aspect of the ground, which lies low, on the level of the sea, and exposed to the full rays of a burning sun; perhaps the quality of the soil may have something to do with it, though this is apparently similar to what prevails in the province of Rio Janeiro. This soil, which is highly argillaceous, and strongly tinged with tritoxyde of iron, is formed by the decomposition of Gneiss or granite rocks. The flat situation of this Tea ground is unfavourable

to the improvement of the soil, for the heavy rains which wash away the superfluous sand from slanting situations, of course only consolidate more strongly the remaining component parts, where the land lies perfectly level, and thus the Tea plants suffer from this state of soil.

The kindness of M. de Brandao, Director of the Botanic Garden, induced him to invite me, shortly after I had seen this above-described Tea ground, that I might inspect all the operations for the preparation of Tea. I found that the picking of the leaves had been commenced very early in the morning, and two kilogrammes were pulled that were still wet with dew. These were deposited in a well-polished iron vase, the shape being that of a very broad flat pan, and set on a brick furnace, where a brisk wooden fire kept the temperature nearly up to that of boiling water. A negro, after carefully washing his hands, kept continually stirring the Tea leaves in all directions, till their external dampness was quite evaporated, and the leaves acquired the softness of linen rag, and a small pinch of them, when rolled in the hollow of the hand, became a little ball that would not unroll. In this state the mass of Tea was divided into two portions, and a negro took each and set them on a hurdle, formed of strips of Bamboo, laid at right angles, where they shook and kneaded the leaves in all directions for a quarter of an hour, an operation which requires habit to be properly performed, and on which much of the beauty of the product depends. It is impossible to describe this process: the motion of the hands is rapid and very irregular, and the degree of pressure requisite varies according to circumstances; generally speaking, the young negro women are considered more clever at this part of the work than older persons. As this process of rolling and twisting the leaves goes on, their green juice is drained off through the hurdle, and it is essential that the Tea be perfectly divested of the moisture, which is acrid, and even corrosive, the bruising and kneading being specially designed to break the parenchyme of the leaf, and permit the escape of the sap.

When the leaves have been thus twisted and rolled, they are replaced in the great iron pan, and the temperature raised till the hand can no longer bear the heat at the bottom. For upwards of an hour the negroes are then constantly employed in separating, shaking, and throwing the foliage up and down, in order to facilitate the desiccation, and much neatness and quickness of hand were requisite, that the manipulators might neither burn themselves nor allow the masses of leaves to adhere to the hot bottom of the pan. It is easy to see that, if the pan were placed within another pan filled with boiling water, and the leaves were stirred with an iron spathula, much trouble might be obviated. Still, the rolling and drying of the leaves were successfully performed; they became more and more crisp, and preserved their twisted shape, except some few which seemed too old and coriaceous to submit to be rolled up. The Tea was then placed on a sieve, with wide apertures of regular sizes, and formed of flat strips of Bamboo. The best rolled leaves, produced by the tips of the buds and the tenderest leaves, passed through this sieve, and were subsequently fanned, in order to separate any unrolled fragments which might have passed through with them; this produce was called *Imperial*, or *Uchim Tea*. It was again laid in the pan till it acquired the leaden grey tint, which proved its perfect dryness, and any defective leaf which had escaped the winnowing and sifting was picked out by hand. The residue, which was left from the first fanning, was submitted to all the operations of winnowing, sifting, and scorching, and it then afforded the *Fine Hyson Tea* of commerce; while the same operations performed on the residuum of it, yielded the *Common Hyson;* and the refuse of the third quality again, afforded the *Coarse Hyson*. Finally, the broken and unrolled foliage, which were rejected in the last siftings, furnish what is called *Family Tea*, and the better kind of which is called *Chato*, and the inferior *Chuto*. The latter sort is never sold, but kept for consumption in the families of the growers. Of all these different products M. de Brandao had the kindness to furnish me with samples, which I have the honour to present to you.

Such is the mode of preparation pursued at Rio Janeiro, though I must add, that the process employed at the Botanic Garden being most carefully performed, in order to serve as a model for private cultivators of Tea, the produce is superior to the generality, so that we dare not judge of all Brazilian Tea by what is raised at the Garden of Rio. I was also assured, that at Saint Paul each grower had his own peculiar method, influencing materially the quality of the Tea, which decided me to visit that province, where I hoped to gain valuable information respecting the culture and fabrication of Tea, specially considered as an article of commerce.

In the interim, the month of December proving excessively hot and rainy, so as to forbid any distant excursions, I turned my attention to the important object of procuring *Tea plants* in number and state fit for exportation, and observing that almost all the shrubs I saw were far too large for this purpose, I applied to M. de Brandao for his help and advice. This gentleman, in the most courteous manner, offered me either seeds or slips from his own Tea shrubs. The striking of the latter was, he owned, a hazardous and uncertain affair, though it had the probable advantage of securing a finer kind of plant than could with certainty be raised from seed. I, however, began by asking him for newly gathered seeds, in order to sow them in my little nursery garden at Santa Theresa, and he obligingly gave me a thousand of the seeds, perfectly ripe and sound, which is easily known by the purplish-brown colour of their integument. M. Houlet immediately set about preparing the soil in which to plant these seeds, and the earth being excessively argillaceous and hard, much digging, manuring, and dressing were needful; in a word, we neglected no precautions which could contribute to the growth of our seeds. In the interim I allowed not a single dry day to elapse without visiting the country houses near Rio, in all of which I saw something more or less interesting, either in the culture of Tea, or other vegetable productions of commercial value. When investigating the magnificent virgin forests, which afford their finest ornaments to our hothouses, and whence I brought home many charming

plants to the garden of the Museum of Natural History at Paris, I also detected the origin of many of our most precious woods used in dyeing and cabinet-work, and an immense quantity of substances employed as drugs. By thus collecting the specimens of the woods, along with their foliage, flowers, and fruit, I ascertained the botanical characters and names of the trees which yield the *Palissandre* or *Jacaranda*, the *Gonzalo Aloez*, the *Vinhatico*, and many others of such importance that our ships from Havre and Bourdeaux annually bring home large cargoes of them.

It is certainly remarkable, and I may add, little to the credit of science, that these eminently useful trees are less known than many others which are valueless to mankind, and possessing scarcely any scientific interest. The origin of certain dye-woods, at the head of which I may place the famous *Brazil-wood*, was still a subject of dispute among naturalists, and the solving of this question was no light matter among merchants, many of whom had risked their property in speculations on this wood, which in their ignorance on its real origin they believed to be afforded by another tree of the same family, and very similar to the true *Brazil-wood*, the monopoly of which is claimed by the Brazilian government. The information that I collected, both from the growing trees and plants, and from the documents kindly afforded by well-informed individuals, enabled me to establish the origin of this and of different barks, possessing strong medicinal virtues, of which I brought home specimens for the School of Pharmacy. In my excursions I had often the opportunity of observing the extraction of the true *Balsam of Copaiba*, trickling from broad clefts made in the trunk of the *Copaifera*, a very lofty tree, growing singly in the mountain forests near Rio. I also gathered several pieces of *Copal resin* from the stems and at the foot of the *Hymenæa Courbaril*. M. Riedel pointed out to me a true species of *Cinchona*, growing on the mountains of Tijuka, which may probably afford a *Quinine Bark*, equally febrifugal in its qualities as the Peruvian *Cinchonas*, if I may judge by the botanical analogy between these

far-famed trees. Anxious to establish a point of such medicinal and commercial importance, I have deposited in the Museum of Natural History in Paris, flowering specimens of the *Cinchona*, found by M. Riedel and others, collected from a tree which is known under the very incorrect name of *Rio Quinine*, but which belongs to a genus quite distinct from the *Cinchonas*. To close the enumeration of my discoveries, I shall content myself with adding, that I detected, growing not unfrequently in the environs of Rio, the *Ilex Paraguayensis* of M. Auguste de St Hilaire, perfectly identical with the tree which the Jesuits planted in the Missions of Paraguay, and whose foliage is an article of great importance throughout Spanish America, and vended under the name of *Paraguay Tea*. A living plant of this shrub was brought home by me, and placed in the Royal Garden at Paris, as well as a species of *Vanilla*, and many other rare and interesting plants. I also made a valuable collection of woods employed for dyeing, building, and cabinet-work, with samples of their flowers, fruit, and leaves, to facilitate botanical determination.

Early in January, 1839, M. Houlet began anew sowing Tea, not only in the open ground in our little garden, but also in pans, in order to facilitate the lifting of the young plants, and putting them into the cases that I had brought for the purpose. The heat being excessive, we purchased mats, that we might shelter them from the sun, and we gave them water far more frequently. Many of the seeds that we had sown a month previously were already appearing above ground, but the soil being of too compact a nature, some did not come up, which warned us to make choice in future of a lighter kind of soil.

The period now arrived when I was to visit the Tea plantations in the province of St Paul; and hoping that the cultivators would give me some of the young shrubs, I took M. Houlet with me, leaving the charge of our collections and seedlings to a M. Pissis, a French geologist and engineer, with whom I had formed an intimate acquaintance, and who most obligingly offered to attend to them during my absence.

Many were the influential persons at Rio Janeiro, who gave me introductory letters to the proprietors and Tea growers of St Paul; the family of M. Venancio Gomez wrote in my favour to the governor of that province, who is their relation. M. Riedel sketched out a minute plan for my road, and the objects chiefly worthy of my attention; and finally, M. T. Grouz gave me a most striking instance of friendly condescension, by quitting for some time his numerous patients, that he might become my patron and interpreter with the influential personages to whom I was recommended.

We started on the 15th of January, by steam-boat, and in two days reached Santos, the principal port in the province of St Paul; thence crossing the great chain of mountains, named the Serra do Mar, in caravans drawn by mules, we reached the city of St Paul on the 20th January, where I experienced the warmest reception from the Governor, two ex-Governors, and some other gentlemen. The letters that I carried, dwelt especially on the fact, that my mission was connected with no object that could be prejudicial to the interests of Brazil, and that it was advisable to show all friendliness towards the French nation, which had ever testified an amicable disposition towards foreigners, and Brazilians in particular. Perceiving that my residence in this city might be prolonged till the middle of February, I secured apartments in the only hotel which it can boast: it is kept by a Frenchman, who invariably treated me with all the civility and attention due to a fellow-countryman.

Accompanied by M. J. Gomez, and a M. Barandier, a historical painter, whom the desire to visit a new country, and to see its inhabitants, had induced to become my *compagnon de voyage*, we visited almost immediately a M. Feijo, ex-Regent of the Empire, and now President of the Provincial Senate. We found this venerable ecclesiastic at his country-house, two leagues distant from the city, and here we saw all the processes pursued on the Tea leaf: commencing by the bruising, drying, and scorching of a large quantity of foliage picked the preceding evening. The chief differ-

ence that struck me in the mode here adopted, was, that the tender, flexible, and not brittle leaves, were gathered with the petiole and tip extremity of every bud, and that some water was put with them into the iron pan, in which the negresses twisted, squeezed, broke, and shook the masses of foliage. The operation was, on the whole, more neatly performed than at Rio. When the Tea was perfectly dry and removed from the pan, it was placed aside in a box, shaded from the air and light, and was considered ready for present use, on the spot; but M. Feijo informed me, that when sent to a distance, the cases were hermetically closed, and the Tea underwent an extra desiccation over the fire.

The plantations belonging to M. Feijo, and surrounding his Chagara, are extensive, containing about 20,000 Tea shrubs, of fine growth and in high vigour, most of them six or eight years old, set in regular lines, a metre asunder from each other, and the lines with a metre and a half betwixt them. The soil is excellent, argillaceo-ferrugineous, as is generally the case near St Paul. On another part of M. Feijo's property I noticed a complete set of European ploughs, and other agricultural instruments.

In the Botanic Garden at St Paul, some squares are devoted to the growth of Tea; but I am not aware that the leaves are ever subjected to preparation.

M. da Luz had invited us to inspect his Tea grounds near Nossa Seuhora da Penha, and I went thither, accompanied by Messrs Barandier and Houlet. The cultivation is admirable, the soil excellent, and the Tea plants peculiarly vigorous. Each shrub was so placed that a man can easily go all round it, and young plants, self-sown, were springing up below every old one; of these off-sets I was made welcome to as many as I could take away, and should have had a great stock, but that the ground had been very recently cleared. M. da Luz showed me his magazines of prepared Tea, which were extensive and well-stocked.

Hence I went to the property of a lady, Donna Gertrude Gedizo e Lacerda, situated at the foot of the Jarigua, a

mountain famed for its gold mines, and passed two days in exploring this celebrated locality, and then visited the Colonel Anastosio on my way back to St Paul. These plantations are in the most prosperous condition, situated on a sloping and well-manured tract behind the habitations. The shrubs are generally kept low, and frequently cut, so as to make them branching, by which the process of picking the leaves is rendered easier. There may be 60,000 or 70,000 plants, but a third of them were only set a year before. Every arrangement is excellently conducted here; the pans kept very clean, though perhaps rather thin from long use and the fierceness of the fires. But the general good order that prevails, speaks much in favour of the Tea produced in this neighbourhood. The colonel showed me his warehouse, where the Tea is stored in iron jars, narrow-necked, and closed by a tight-fitting stopper. I ventured to put some questions to Colonel Anastosio respecting the sale of the produce. He gave me to understand that he was by no means eager to sell; but confident of the good quality, he waited till application was made to him for it, as the Tea is thought to improve by time, and the price is kept up by there being a small supply. With respect to the cost of its production in Brazil, he said, this was so great, that to make it answer to the grower, a price of not less than 2,000 reis, about 6 francs (5s.) must be got for each lb. The whole labour in Brazil is done by slaves, who certainly do not cost much to keep, but who on the other hand, work as little as they can help, having no interest in the occupation. The slaves, too, bear a high price, and the chances of mortality with the exorbitant value of money in Brazil, augment their selling value.

The Major da Luz kindly presented me with 300 young Tea plants, which he had caused his negroes to pull up for me, and in an adjoining farm, where an immense tract planted with Tea, is now allowed to run to waste, being no object of value to the proprietor, I was permitted to take all I could carry away; and in a single day's time, M. Houlet and I, aided by some slaves, succeeded in possessing ourselves

of 3,000 young plants, which we carefully arranged in Bamboo baskets (here called Cestos). To diminish the weight, M. Houlet removed as little soil as possible; but carefully wetted the roots before closing the baskets, and covering them with Banana leaves. In one garden, the largest I have seen devoted to the growth of Tea, but which is not particularly well kept, I saw that the spaces between the shrubs were planted with *Maize ;* and the bordering of the squares which intersect this vast plantation, and the whole of which is enclosed with alleys of *Araucaria Brasiliensis*, is formed of little dwarf Tea plants, which are kept low by cutting their main shoots down to the level of the soil.

On the 8th of February, I again embarked in the steamboat to return to Rio Janeiro, and when we came in sight of St Sebastian, I left M. Houlet to proceed to the city alone, charging him to take the very greatest care of our package of Tea plants, as well as of the nursery ground at St Theresa, while I should visit the flourishing colony of Ubatuba, inhabited by French families, who cultivate most successfully *Coffee*, and other useful vegetables. After a delightful sail through an archipelago of enchanting islands, I landed at Pontagrossa, where I was most kindly received, and spent a week, obtaining much and varied information, both respecting cultivated plants, and the kinds of trees which grow spontaneously in the virgin forests of this lovely land, and afford valuable woods for building, cabinet work, and dyeing. Finally, I visited the Tea plantations of M. Vigneron, which are remarkably fine, though their owner finds a much more profitable employment in the growth of *Coffee*, which is very lucrative. He kindly gave me a great quantity of young *Tea Plants* and *Chocolate Trees*. Reluctantly quitting these worthy colonists, I re-embarked in a Brazilian galliot, which took me back to Rio Janeiro on the close of February. There I found the Tea plants from St Paul, set by M. Houlet, in our garden at St Theresa, and I added to them the stock that I had brought from Ubatuba. All the very young ones had perished on the way, from the exces-

sive heat, and M. Houlet had much difficulty in saving the others.

In the hope that French vessels from the Rio Plata would touch at Brazil during the month of April, I now turned my attention to the preparation of chests, in which I could pack my treasures; and finding that Brazilian and French carpenters asked exorbitant sums for their work, I adopted the plan of purchasing the necessary wood and iron myself, and setting two negro carpenters to work by the day, at making the cases under my directions and the inspection of M. Houlet. My first plan had been to construct boxes on Mr Ward's system; but the heavy price deterred me, while the safety with which I had brought my fruit trees from Europe in a box with sliding pannels, induced me to fix finally on this latter mode of construction. Much anxiety and trouble did the formation of these chests cost me, as well as the case which should contain the hot-house plants for the Museum at Paris; but I was enabled to pursue, at the same time, my inquiries and researches in the neighbourhood of Rio Janeiro, through the months of March and April. M. Dumas, of the Academy of Sciences, having charged me to procure information respecting a vegetable wax from Brazil, in which he had found a new principle, I sent him a specimen of *Carnauba*, a substance holding a middle place between wax and rosin, and which forms an article of commerce between the north of Brazil and Montevideo, and even England.

A French ship, the HEROINE, commanded by Captain Cecille, arrived at Rio on the 9th of May, while I was on the Organ mountains, visiting the great agricultural establishments of M. March, where I hoped to obtain more Tea plants to add to my stock. I returned to town in all haste, and was mortified to find how little progress had been made towards completing our packing chests. I also wished to visit the Botanic Garden once more, that I might procure some Tea shrubs, as recently moved as possible, with a quantity of perfectly fresh seeds. M. Cecille instantly sent me two ship-carpenters, who in a very few days despatched more work

than my negroes had done in a month, and further, he kindly caused his sailors to carry my chests from Santa Theresa to the place of embarkation. All being ready, I paid my last visit to the Botanic Garden, where I received 700 well-rooted Tea plants, and 2,000 ripe seeds: the latter were sown by M. Houlet, in the spaces between the growing plants, and the whole occupied 18 large chests. All my arrangements were completed on the 20th of May, when I paid a reluctant farewell to the numerous friends who had so kindly noticed me at Rio, and embarked the same evening.

Very pleasing was the sight to me, when the day after the Heroine had sailed, I beheld my 18 precious boxes, arranged two and two in such a situation as kept them steady and level, permitted them to receive light and to have the moveable pannels closed in case of bad weather. The vigour of my Tea plants and the lovely verdure of their foliage had been generally admired at Rio, and I fondly anticipated the most prosperous results from my expedition. But short-lived was this satisfaction. Two days after, heavy north winds drove us off our course, the sea became more boisterous than is usual in these latitudes, and the necessity for closing the ports, lest the spray should irrevocably ruin my plants, caused them a great injury by the necessary exclusion of light. To the latter circumstance, I attribute the first deterioration of my plants, especially those more recently set. When the sea became calmer, and permitted us to open the port holes, the wind sweeping the surface of the waves, cast a fine salt-water spray on my boxes, which doubtless proved highly injurious, since the contents of those chests that were exposed to the wind suffered much more than those on the other side. By the 11th of June, most of the Teas had lost their foliage, and the stalks even of several were quite dried up; but I hoped that some might sprout from the root. Some of the seeds had germinated, the young shoots were slender, long, blanched and furnished with a few pale leaves. By the 2d of July, in latitude 24° north, and longitude 42° west, the strongest shrubs were suffering most severely, while some had sent out suckers

and the young seedlings had assumed a greener tint. Capt. Cecille took great interest in the safety of my protegès, and while the leakage of some of the water casks had compelled him to put the whole ship's crew on a slender allowance of water, he ordered me an increased quantity for the benefit of the Tea shrubs.

On the 24th of July, the Heroine cast anchor in the harbour of Brest, and while anxiously awaiting directions for the disembarking, and forwarding to Paris, of my dearly valued treasures, I visited the western extremity of the department of Finisterre. Here the soil and climate appeared to me peculiarly suitable to the culture of Tea, and subsequent observations have confirmed this opinion. In no part of the French territory are *Camellias* raised so fine in the open air; and the nature of the ground bears much resemblance to that of Brazil, while the low price of handicraft works among a poor and ignorant population, would form a strong additional recommendation.

The Brazilian *Tea shrubs* reached Paris in the end of August, and M. Mirbel charged the chief gardener at the Royal Gardens to prepare frames and beds in which to deposit the surviving plants, which are 1,500 in number, about one third of the original stock, including young seedlings. M. Houlet continues to pay attention to them, and I quite expect that by next spring, they may be fit for removal to those parts of France that shall be judged most suitable to their attempted culture on an extensive scale.

And now to come to the important question, whether the growth and preparation of Tea can furnish an advantageous branch of agriculture in France,—the decision rests on so many contingencies, of the quantity of respective produce from a given portion of soil, and the price to be realized by the article when produced, that it is very difficult to arrive at a satisfactory and correct answer. In Brazil, where, as I have stated above, the culture of the shrub succeeds perfectly well; where the gathering of the foliage proceeds with hardly any interruption during the entire year, where the quality

(setting aside the aroma which is believed to be artificially added) is not inferior to that of the finest Tea from China, still the growers have not realized any large profits. They have assuredly manufactured an immense quantity of Tea, to judge by what I saw in the warehouses at St Paul, but they cannot afford to sell it under 6 francs for the half kilogramme, a lb. weight, which is higher than Chinese Tea of equally good quality. Indeed, the trade of Tea is still in great activity between China and Brazil, partly by ships which come straight from the former country to Rio Janeiro, and partly through the United States. Could we ensure France a similar modicum of success in rearing the plants, as in Brazil, it may be fairly calculated that considerable improvements would take place, the lower price of labour would diminish the cost of its produce, more economical and expeditious plans for preparing the leaf might easily be invented; and finally, if we could succeed in imparting the perfume that distinguishes the Chinese Tea, there can exist little doubt that our home grown article might compete advantageously with the foreign one, especially in the event of a war with China, or other interruption of our maritime intercourse with the East. Whatever be the tenor of future public affairs, the cultivation of the Tea plant should, under every circumstance, be carefully essayed in France; a fair trial should be given to it, and as it could not be prejudicial to other agricultural interests, requiring such a locality as is little adapted to other productions, I am the more disposed to think that it merits the encouragement and favour of Government.

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## II.—BOTANICAL INFORMATION.

Mr Pamplin has just received a letter from Dr Steudel of Eslingen, dated August 26, 1840, in which that gentleman states, for the information of the friends of the Unio Itineraria, who have already subscribed to the Abyssinian botanical collections of Mr Schimper, that upon further consideration, "the Directors of the Unio Itineraria have decided

upon accompanying the first distribution of his plants with printed tickets of names, &c., as far as the species can be determined, instead of issuing them with numbered labels only as was at first intended. This arrangement, which though tedious from the novel or little known forms of vegetation under review, is however fast advancing to completion; and it is confidently hoped, that in the month of October or November at furthest, the collections will reach the hands of the respective subscribers, whose patience, it must be confessed, has been long, though unavoidably, still we trust, not disadvantageously, tried."

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### *Remarks on the Genus* SPHÆROSTEPHANOS *among Ferns.*

MR JOHN SMITH writes to us in a letter dated Royal Botanic Gardens, Kew, August 26th, 1840. "It is now about six years ago that I first became possessed of a Fern, which at the time struck me as something curious. Of this, Mr Bauer kindly made me a drawing, which satisfied me that there was sufficient character to constitute a new Genus, and which has been given in your '*Genera Filicum,' tab.* xxiv, under my name of *Sphærostephanos,* which appellation I gave to it on account of the appearance of the (then supposed) remarkable elevated indusiform receptacle, the apex of which was terminated with numerous sphærical glands.—When the drawing was sent for publication, I had not at that time the opportunity of comparing it with a structure noticed by Mr Brown in his observations on *Polypodium,* in Horsfield's '*Flora Javæ.*' In that article there is mention made of a form (of which it is said there is more than one species) which Mr Brown proposes as a Genus, giving it the name of *Mesochlæna.* That gentleman has lately presented me with a small specimen of it, which I find to be the same as my *Sphærostephanos.*

"The character of *Mesochlæna* is to have a short linear sorus, situated in the middle of the vein, and furnished with

an indusium which is attached lengthways along the middle of the sorus; its margins free.

"In the early state of the sorus the indusium is flat, but as the capsules advance towards maturity, the sides of the indusium are consequently raised up, and ultimately appear to collapse, and the margins being glandulose give the appearance as represented at *fig.* 7. *tab.* xxiv. (*Genera Filicum*); and which was drawn by Mr Bauer from my too mature specimens. Thus my name of *Sphærostephanos*, being founded upon a false view of the indusium, must of necessity give way to Mr Brown's more appropriate name *Mesochlæna*, of which I make three species, thus:—

"MESOCHLÆNA. *R. Br. in Horsfield's Fl. Javæ.* Sphærostephanos. *J. Sm. in Hook. Gen. Fil. t.* xxiv. Polypodii sp. *Wall.*

"1. M. *Moluccana. R. Br. mst.*

"2. M. *Javanica. R. Br. mst.*

"3. M. *asplenioides.* Sphærostephanos asplenioides. *J. Sm. loc. cit.*—Polypodium villosum. *Wall. in Herb. J. Smith.*"

Mr Smith has since communicated the following additional remarks on Mr Brown's Genus *Mesochlæna.*

"Having formerly viewed this genus as having sori destitute of an indusium, I therefore placed it in the tribe *Polypodieæ*, near to *Stegnogramma* of Blume; but now, having evidence of the true structure of the indusium, which is characteristic of the tribe *Aspidieæ*, in which tribe it must now be placed, and on viewing its habit, venation, and position of the sori, its nearest affinity will be with the genus *Nephrodium* (as now restricted), the technical distinction between the two resting entirely on the sori of *Nephrodium* being punctiform, whereas in *Mesochlæna*, the sori are linear, the latter in that respect being nearly similar to the sori of *Didymochlæna*: but in *Didymochlæna* the sori are produced on the apex of the venules (terminal), which are all free; whereas in *Mesochlæna* and *Nephrodium*, the lower or more pairs of the venules meet (and form an angular anastomose) with the venules of the proximate fascicle, and the sori are produced on or about

the middle of the venules (lateral). Besides the affinity that *Mesochlæna* has with the above mentioned genera, it also, in appearance, exhibits some similarity in habit and form of the sori to those species of *Diplazium* which have regular bipinnatifid fronds and short sori ; but the latter genus is readily distinguished by having a laterally attached indusium on each side of the venules, whereas in *Mesochlæna*, the venules produce only a simple sorus, with the indusium attached along the centre of the venule, and like the generality of *Aspidieæ* is very fugacious."

J. SMITH.

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## III.—*Contributions towards a Flora of South America and the islands of the Pacific.* By SIR W. J. HOOKER, LL.D., and G. A. W. ARNOTT, Esq., LL.D.

### I. EXTRA-TROPICAL SOUTH AMERICA.

(*Continued from page* 254 *of Vol.* II. *of the Companion to the Botanical Magazine.*)

### Subtribe II. BACCHARIDEÆ. *Less.*

PLAGIOCHEILUS. *H. et A. De Cand. Prodr.* vi. *p.* 142.

*Involucrum* subtriseriale foliolis obovato-oblongis. *Rachis* hemisphærica. *Flores* fœminei multiseriales in ambitu, reliquis paucis masculis. *Achenium* calvum, oblongo-obovatum, compressum, puberulum, erostre. *Ovarium fl. masc.* nullum. *Corolla fœm.* tubo brevissimo, limbo obliquo subbilabiato, labio exteriore horizontaliter patulo, tubum subæquante, interiore brevissimo utroque integerrimo ; *masc.* tubo breviusculo gracili, limbo campanulato.—Herba *ramosa, erecta, pilosula.* Folia *alterna, interrupte pinnatifida, laciniis inciso-pinnatifidis, basi auriculata, auriculis incisis, amplectantibus.* Capitula *subglobosa, corymboso-paniculata, lutea, vix* Grangeæ *magnitudine.*

1039. (1.). P. *tanacetoides,* H. et A.—*De Cand. Prodr. v.* vi. *p.* 142.—Coast of the Parana, in sandy places. *Tweedie.*—The female florets are very remarkable, resembling the mouth of an ewer. What we here speak of as an inner lip to the

corolla, is a mere gibbosity; it becomes therefore difficult to say whether it ought not to be considered as a ligulate floret, in which case the genus would rank next to *Solenogyne;* but considering that the central florets are sterile, we prefer placing it near *Dichrocephalus* (*Centipeda,* Less.), and *Grangea,* with which it agrees much in habit.

Professor De Candolle has adopted this Genus, which was communicated to him in mst. and has placed it in the "*Compositæ Senecionideæ,*" adding a second species, thus :—

(1. P. *tanacetoides* (Hook. et Arn.) ; erectus ramosus pilosulus, foliis interrupte pinnati-partitis basi amplexicauli-auriculatis partitionibus inciso-serratis, capitulis corymbosis.

2. P. *solivæformis,* (DC.); glabriusculus demissus ramosus repens, foliis petiolatis pinnati-partitis, partitionibus linearibus parce lobatis, ultimis apice trilobis, capitulis solitariis longe pedicellatis.—Hab. in Republica Bolivaria. *Pentland.* Pili parcissimi secus ramos et folia novella sparsi. Achenia parce glandulosa glabra. (*DC.*)

1040. (1.) Conyza *Chilensis, Spr.—DC. Prodr.* v. *p.* 378. —C. longifolia, *Cass.*—Chili. *Bridges* (*n.* 624). Maldonado and Entro Rios. *Tweedie* (n. 1077.)—To this, and not to *C. albida,* we are inclined to refer *Erigeron Bonariense, Linn. and Dill. Hort. Elth. t.* 257, *f.* 334, in bud; although De Candolle considers that a species of *Erigeron* with which he is unacquainted.

1041. (2). C. *albida, Willd. DC. Prodr.* v. *p.* 378.—Erigeron Canadense, *Don, Mst.* (non Linn.). E. tramontanus, *Gill. mst.*—Mendoza. *Gillies.* (n. 156). Buenos Ayres and North Patagonia. *Tweedie.* Valparaiso. Bridges, (n. 987). *C. linearis, DC. Prodr.* v. *p.* 378, is our *Erigeron stenophyllus, α.;* and our *Conyza ambigua, Bot. of Beech. Voy. p.* 57, is an imperfect state of our *E. spiculosus.*—See our observations on *Erigeron* and *Conyza,* in *Comp. Bot. Mag. v.* ii. *p.* 254.

1042. (3.) C. *diversifolia,* (Weinm. in Flora, 1820, p. 611); herbacea ad collum suffruticosa erecta tota villoso-cinerea, caule simplici pilis confertissimis hirsuto, foliis pube breviori velutino-villosis subtus hirsutis elongato-linearibus acutis,

infer. hinc inde grosse serratis cæteris integerrimis, panicula oligocephala pubescente, capitulis pedicellatis, invol. squamis linearibus pube appressa parva vix cinereis.—*DC. Prod.* v. *p.* 378.—In pascuis Chilensibus ad Fernando. *Bertero.*—We are unacquainted with this, unless it be our *Erigeron strictus* (*n.* 1019), which Dr Scouler found in Juan Fernandez, and Mr Cuming at Valparaiso. De Candolle refers to it, with a question, our *Conyza ambigua* (*Erigeron spiculosus*).

1043. (4.) C. *triplinervia, Less. in Linnæa.* 1831. *p.* 137. *DC. Prodr.* v. *p.* 377.—South Brazil. *Tweedie* (*n.* 955.).—This has completely the habit of *Baccharis*, especially of some species in the first section.

BACCHARIS. *L.* (*including* MOLINA, *R. et P. and Less.*).

§ 1. Trinervatæ, *nempe foliis tri-aut triplinerviis non imbricatis, nec cuneatis, ramis apteris.—DC.*

1044. (1.) B. *longipes* (*Kunze in Poepp. Coll.* ii. *n.* 104.)—*DC. Prodr.* v. *p.* 401.—Stony inundated places, Rio de Chili. *Poeppig.*—Of this, with which we are unacquainted, De Candolle says, "proxime accedit ad *B. glutinosam*, et præsertim ad *B. parvifloram*, et si hybridæ facile admittendæ essent, ut utriusque proles mixta fere videtur.

1045. (2.) B. *racemosa* (*DC. Prodr.* v. *p.* 401); fruticosa ramis striatis patentibus, foliis sessilibus rigidis ovatis acutis basi obtusis triplinerviis reticulato-venosis usque ad basin spinuloso-serratis supra glabris subtus pubescenti-scabris et valde elevatim nervosis, panicula copiosa pyramidato-corymbosa, involucri campanulati squamis lineari-oblongis obtusis margine scarioso-pallidis.—β. foliis angustioribus.—Molina racemosa, *R. et Pav. Syst. p.* 209.—Baccharis sessilifolia, *Less.*—*DC. Prod.* v. *p.* 418.—B. rigida, *Hook. et Arn. in Bot. of Beech. Voy. p.* 57.—B. riparia, *Poepp. Coll. Chil. n.* 209.—Woods and groves in Chili. *Ruiz and Pavon. Poeppig.* Valparaiso. *Macrae. Bridges* (*n.* 57. β.) *Mr Cruikshanks. Beechey. Cuming* (*n.* 790 *a.* and β.), *Chamisso.*—Our plant is extremely common in Chili, and one of the best marked of species. It is undoubtedly the *B. sessiliflora* of Lessing

and De Candolle, which latter author places it in his section "*Oblongifoliæ*," although the leaves are truly 3-nerved. We think it is equally certainly the *Molina racemosa* of Ruiz and Pavon, and therefore adopt the name of those authors though not strictly characteristic. De Candolle makes our *B. rigida* a var. of *B. oblongifolia*, a very obscure species of Sprengel.

1046. (3.) B. *eupatorioides* (Hook. et Arn.): elata fruticosa erecta, ramis angulato-sulcatis pubescenti-glandulosis, foliis sessilibus submembranaceis oblongis acuminatis remote spinuloso-dentatis (dentibus angustis) basi integerrimis trinerviis supra glabris margine nervisque modice elevatis subtus pubescenti-scabriusculis, panicula corymboso-pyramidata, involucri campanulati squamis lineari-oblongis acutiusculis margine pallidis.—$\alpha$. (*masc.*) foliis quadripollicaribus latis fere ovato-oblongis, siccitate nigrescentibus. Isle la Moche, South Pacific Ocean. *Dr Eights.*—$\beta$. foliis quadripollicaribus angustioribus. Chiloe. *Cuming* (*n.* 56).—$\gamma$. foliis bipollicaribus angustioribus. Fields near Valdivia. *Bridges* (*n.* 578).—This seems to be a very southern species, and also a most distinct one, although ranking next *B. racemosa.* Its leaves are very much larger and longer; there is nothing of the harsh and rigid character of the preceding species, nor of the copious broad triangular teeth reaching quite to the base.

1047. (4). B. *ovata* (Hook. et Arn.); fruticosa, ramis striatis pubescentibus, foliis exacte ovatis submembranaceis acutiusculis trinerviis fere ad basin obtusissimam denticulato-serratis brevissime petiolatis, petiolo late alato nervisque subtus læviter elevatis pubescentibus, paniculis densis corymboso-pyramidatis, involucri campanulati squamis lineari-oblongis interioribus apice ad marginem eroso-fimbriatis.—St Mary, S. Pacific Ocean. *Dr Eights.*—Leaves 12—14 lines long, 8—10 broad, decidedly petiolated, exactly ovate, rather closely and very regularly denticulato-serrate. In habit it approaches the preceding.

1048. (5). B. *serrulata* (Pers.); herbacea erecta glabra, caule basi tereti apice angulato, foliis petiolatis lato-lanceo-

latis acuminatis ciliato-serratis trinerviis minutissime punctulatis, corymbo composito terminali fastigiato, invol. ♂ campanulati squamis lanceolatis acutiusculis.—*DC. Prodr.* v. *p.* 402. Conyza serrulata *Lam. Dict.?*—*β.* foliis linearibus.—Buenos Ayres, Banda Orientale and N. Patagonia. *Tweedie.*—*β.* St Mary, S. Pacific Ocean. *C. Darwin, Esq.* Monte Video. *Isabelle.*—Scales of the involucre lanceolate or linear-lanceolate, pale, with a darker greenish line down the centre. The corymb and young upper leaves are often glutinous. Pappus tawny, sometimes almost rufous.

1049. (6). B. *Pingræa* (*DC. Prodr.* ii. p. 420); herbacea erecta glutinosa, caule basi tereti apice angulato, foliis petiolatis lineari-lanceolatis acuminatis basi attenuatis trinerviis punctatis remote dentatis summis linearibus integerrimis, corymbo composito terminali, involucri campanulati squamis lanceolatis acutiusculis marginibus pallidis fimbriato-ciliatis.—*β.* foliis angustissimis.—Molina linearis. *Less. et Cham.* (Herb. nostr.) *in Linnæa, non R. et P.; non* Baccharis linearis. *H. et A.*—Chili, frequent in moist places. Valparaiso. *Bridges* (*n.* 59). *Chamisso.* Conception. *Cuming* (n. 800).—*β.* Chili. *Cuming* (*n.* 72.). *Gillies* (*n.* 189.).—2—4 feet high, with a decidedly herbaceous stem and annual root. Habit of *Conyza.* De Candolle describes it as a suffruticose plant, and omits to notice the three nerves and hence probably lost sight of its affinity with his *B. serrulata*, a species so nearly allied to it, that except the usually broader foliage of the latter, and its more close narrow serratures (almost ciliæ) not teeth, directed upwards, we can scarcely point out any difference. Capitula exactly the same in both. It is undoubtedly the *Molina linearis* of Chamisso and Lessing, and according to De Candolle of Poepp. (Coll. Chil. 2. *n.* 103). The original *linearis*, as we believe, is a shrubby plant, well known by its vernacular name of "Romaro," or Rosemary bush.

1050. (7). B. *marginalis* (*DC. Prodr.* v. *p.* 402); suffruticosa resinosa subviscosa glabra, foliis lineari-lanceolatis utrinque acutis integerrimis aut parce serratis trinerviis, nervis lateralibus margini approximatis, corymbis compositis foliosis

polycephalis, invol. campanulati squamis lanceolatis ciliato-erosis ♂ latioribus magis fimbriatis, ♀ angustioribus, achænio glabro. *DC.*—Molina parviflora. *R. et P.?* Baccharis parviflora, *Pers. non Poir.*—Valparaiso. *Gaudichaud.*—De Candolle seems to have drawn up his character from Chilian specimens, and doubts if those from Peru should be considered the same species.

1051. (8). B. *Feuillei* (*DC. Prodr.* v. *p.* 403); frutescens, pube minutissima subpulverulenta, ramis teretibus substriatis, foliis breviter petiolatis lanceolatis utrinque attenuatis grosse serratis triplinerviis, capitulis ♂ in corymbos compositos terminales subaphyllos digestis 18—20 floris, invol. ovati squamis lanceolatis acutis stramineis. *DC.*—*Feuill. Per. et Chil.* ii. *p.* 750. *t.* 37.—Chili?—De Candolle does not indeed give this as an inhabitant of Chili, but the species is founded on the *Conyza frutescens*, &c. of Feuillée, which, though not expressly stated, we believe to be a native of Chili, and the same with *B. glutinosa*, Pers., under which species De Candolle again quotes it in the Prodromus. Perhaps *B. Feuillei* and *B. marginalis* ought both to be referred to *B. glutinosa.*

1052. (9). B. *glutinosa* (*Pers. Syn.* ii. *p.* 425); suffruticosa glaberrima viscosa, foliis lanceolatis coriaceis grosse serratis punctatis trinerviis et penninerviis basi attenuatis apice acutis, corymbo breviter pedunculato, capitulis ♀ campanulatis, involucri squamis ovati-lanceolatis margine eroso-fimbriatis.—Chilca. *Feuill.* 2. *t.* 37. (*excl. Syn.*) Molina viscosa, *R. et Pav. Hook. et Arn. in Beech. Voy.*—Chili. Valparaiso. *Macrae.*—*Mathews* (*n.* 217.) *Cuming* (*n.* 788.) *C. Darwin, Esq.* Quillota, where it is called "Chilcoa Quilco." *Bridges* (n. 53.) Conception. *Beechey.* Near Mendoza. *Dr Gillies.* Wood-sides of Cordova (foliis latioribus), Tucuman and Buenos Ayres. *Tweedie* (*n.* 1210.)—An extensively dispersed and variable plant. The leaves are more or less broad, more or less dense, toothed and entire, more or less viscid, and more or less coriaceous. The involucre of the female capitula resembles the male's. In all, it is broadly campanulate, somewhat squarrose, of a singularly dry character; the scales are ovate, stramineous,

destitute of nerve, but having a discoloured spot towards the apex; the margin is scariose and eroso-fimbriate. Pappus of the female capitula very white and silky.

1053. (10). B. *sphærocephala* (Hook. et Arn.); fruticosa glabra, ramis angulatis, foliis (subquadripollicaribus) obovato-lanceolatis membranaceis subtriplinerviis reticulatisque acutis grosse dentatis basi attenuatis sessilibus impunctatis, corymbis polycephalis foliis brevioribus, capitulis ♂ et ♀ depressos sphæricis, involucri hemisphærici squamis ovato-lanceolatis acutis dorso carinatis uninerviis marginibus præcipue versus apicem eroso-fimbriatis.—Chiloe. *Cuming* (*n.* 58). Between Osorno and El Rio de Maullin, Valdivia. *Bridges* (*n.* 579.)—A shrub from 4 to 8 feet high, according to Mr. Bridges, with large membranaceous coarsely toothed and dense corymbs of comparatively large capitula (6 lines broad) which are shorter than the leaves.

1054. (11). B. *melastomæfolia* (Hook. et Arn.); fruticosa? glaberrima, ramis sulcatis, foliis coriaceis (3—4—pollicaribus) ovato-lanceolatis serratis triplinerviis reticulatisque serratis brevi-petiolatis supra rugosis subtus pallidioribus nervis prominentibus, corymbis terminalibus axillaribusque pedunculatis aphyllis, involucri squamis paucis laxis, ext. brevibus, int. linearibus obtusis uninerviis, acheniis sulcatis glaberrimis, pappo ♀ flavescente sericeo uniseriali involucrum longe excedente.—Moist woods of Tucuman. *Tweedie* (n. 1185.)—A very distinct and well-marked species, with deeply furrowed branches and broad serrated leaves, wrinkled by the copious reticulations, and resembling those of many *Melastomaceæ.* Female capitula nearly three-fourths of an inch in diameter.

1055. (12). B. *anomala* (*DC. Prodr.* v. *p.* 403); suffruticulosa ramosa, caule tereti, ramis pubescentibus, foliis petiolatis ovatis basi obtusis apice acute dentato-serratis trinerviis supra sparse puberis subtus dense villosis, paniculis ramos terminantibus laxis, invol. ♂ squamis oblongo-linearibus acutis, fl. masc. stylum exsertum gerentibus. *DC.*—Rio Grande, St Catharine's and woody shores of Lagoa, S. Brazil. *Tweedie.*—Leaves an inch long, exactly ovate, obtuse at the

base, on petioles two lines long. Stems, as De Candolle well observes, apparently climbing, so as, in conjunction with the form of the petiolated leaves, to give the appearance of a *Clematis.* Capitula small. Scales of the involucre slightly eroso-ciliate at the margin, with a dark green nerve down the middle. Pappus of the male flowers rufous.

1056. (13). B. *Doniana* (Hook. et Arn.); fruticosa, ramis erectis pubescentibus, foliis anguste lanceolatis subcoriaceis acutis punctatis obscure trinerviis integerrimis rarissime hic illic dente solitario instructis, pedicellis (bilinearibus) pubescentibus nudis monocephalis, involucri campanulati squamis uninerviis, ext. ovatis pubescentibus, int. oblongis glabriusculis apice fimbriato-ciliatis.—S. Brazil. *Tweedie* (*n.* 975.) Rio grande do Sul. *Isabelle.*—This seems very different from any described species. The pappus of the female plant is tawny, longer than the styles, twice as long as the involucre.

§ 2. Cuneifoliæ, *nempe foliis obovatis cuneatisve uninerviis aut triplinerviis non imbricatis, ramis apteris. DC.*

1057. (14). B. *hirta* (*DC. Prodr.* v. *p.* 405); suffruticosa undique piloso-hispida, caule sulcato erecto apice corymboso ramoso, foliis coriaceis sessilibus cuneato-oblongis apice grosse inciso-dentatis trinerviis reticulatisque, corymbis densis subglobosis, involucri ♂ squamis lato-lanceolatis acutiusculis subpubescentibus uninerviis margine pubescenti-ciliatis.—B. verbenæfolia. *Hook. et Arn. mst.*—Pappus rufous, its hairs clavate in the male flower. Maldonado. South Brazil. *Tweedie.*—De Candolle places this very well-marked plant in the first division, but in the cuneate leaves it accords well with the present section, though it must be confessed it has little natural affinity with the following species. The rough coarsely toothed leaves, with the very prominent nerves on the under-side, give the plant a great resemblance to some N. American species of *Verbena.*

1058. (15). B. *Magellanica* (*Pers. Syn.* ii. *p.* 425); fruticulosa demisso-cæspitosa glabra viscosa, ramulis angulatis, foliis sessilibus confertis coriaceis obovato-cuneatis obtusis aliis integerrimis aliis apice obtuse tridentatis, capitulis soli-

tariis ad apices ramulorum sessilibus, invol. ovati squamis margine ciliato-fimbriatis, ♂ ovali-lanceolatis, ♀ angustius lanceolatis acuminatis, acheniis striatis glabris. *DC.*—B. tridentata. *Gaud. Fl. Mal. p.* 15. Conyza Magellanica. *Lam. Dict.*—Straits of Magelhaens (*Lamarck*), at Port Egmont and Deseado. (*Née.*) Falkland islands. *Gaudichaud.* E. Falkland Island (masc.) and Berkeley Sound; Falkland islands (fœm.) *C. Darwin, Esq.* (*n.* 322 and 326.)—A humble dwarf shrub, with something the habit of *Salix herbacea.* Leaves small, and almost spathulate in our female plant, viscid and quite entire; in our male, shining as if varnished, some of them tridentate.

1059. (16.) B. *cuneifolia* (*DC. Prodr.* v. *p.* 406); fruticulosa demissa glabra viscosa ramosissima, ramulis subangulatis, foliis sessilibus confertis coriaceis obovato-cuneatis obtusis ad apicem obtuse repando-subdentatis, capitulis ad apices ramulorum sessilibus confertis. *DC.*—Conyza cuneifolia. *Lam. Dict.*—Straits of Magelhaens (*Lamarck*); at Port Egmont. (*Née*). I think there can be little doubt that this is the same with the preceding. De Candolle is properly disposed to reject the Brazilian specimens which have been referred to this. They perhaps belong to our following species.

1060. (17.) B. *tridentata* (*Vahl, Symb.* iii. *p.* 98); glabra fruticosa, ramis angulato-striatis, foliis sessilibus cuneato-spathulatis obtusis punctatis trinerviis (nervis lateralibus obsoletis) infra apicem utrinque unidentatis, capitulis ♂ et ♀ sessilibus axillaribus cylindraceis subsexfloris versus apicem ramorum subglomeratis, involucri squamis paucis exterioribus ovatis int. oblongis enerviis.—*DC. Prodr.* v. *p.* 409.—South Brazil. *Tweedie.* (n. 994).—The young leaves are glutinous, all of them of a reddish-brown in the dry state, the form between cuneate and spathulate, with 2 lateral opposite and one larger intermediate or terminal tooth. Pappus in the female flowers reddish, longer than the involucre. It seems to agree well with De Candolle's character and that of Vahl. But there is probably more than one species from the different localities given by De Candolle under this plant.

1061. (18.) B. *Baldwinii* (*Hook. et Arn.*); fruticosa glabra, caule prostrato ramisque angulato-striatis, foliis sessilibus lanceolatis basi cuneatis subcoriaceis uninerviis impunctatis acutis supra medium utrinque uni-vel bidentatis, capitulis pedicellatis solitariis in folios supremos ramorum racemos foliosos formantibus, involucri cylindraceo-campanulati 8-10-flori squamis ext. ovatis, int. oblongis marginibus nudis.—M. prostrata. *Herb. Baldw.* (*non R. et P.*) Maldonado. *Dr Baldwin. Tweedie.* Shores of Lagoa and Los Moranharos, S. Brazil. *Tweedie*, (n. 982.) La Reducion do la puerta del Sauce, Pampas of Buenos Ayres. *Dr Gillies.* (n. 169.)

1062. (19.) B. *vernicosa* (*Hook. et Arn.*); glabra fruticosa vernicosa, ramis striatis, foliis spathulatis obtusis punctatis coriaceis uninerviis aliis integerrimis aliis (plerumque majoribus) obtuse tri-quinquedentatis, floribus paucis sessilibus terminalibus solitariis vel binis, involucri cylindrici pauciflori squamis ext. ovatis, int. oblongis.—Uraguay, in marshy woods. *Tweedie.*—Apparently a small twiggy shrub, much branched. Leaves, some small, 3-4 lines long, generally entire, others much larger, nearly an inch long, more or less toothed; all as it were varnished, distinctly dotted, and having no trace of lateral nerves.

1063. (20). B. *axillaris. De Cand. Prodr.* v. *p.* 407.—β. *dentata;* foliis cuneatis omnibus apice 3-5 dentatis. *DC. l. c.* —Via Monte in S. Brazil, *Tweedie.* Uraguay, *Baird.*—What we take for this plant has the leaves about ¾ of an inch long, broadly cuneate, with 3 nerves, the lateral nerves obscure or sometimes obsolete, not dotted, the margins a little thickened or revolute, deeply and coarsely toothed. In the female capitula the pappus is pale reddish, much longer than the involucre, the styles much exserted.

1064. (21.) B. *flabellata* (*Hook. et Arn.*); fruticosa erecta glabra, ramis angulatis junioribus viscosis, foliis flabelliformibus coriaceis grosse angulato-dentatis obscure 3-nerviis obsolete punctatis basi in petiolum attenuatis, capitulis sessilibus axillaribus glomeratis, involucri ovati squamis ovatis uninerviis int. longioribus.—Aguadita, province of San Luis. *Dr*

*Gillies* (*n.* 170.) Remarkable for the broad leaves, coarsely toothed or angled, tapering into a petiole. Capitula small.

1065. (22.) B. *pedicellata* (*DC. Prodr.* v. *p.* 407); fruticosa ramosissima glabra viscosa, ramis teretiusculis, foliis obovato-cuneatis sessilibus apicem versus paucidentatis coriaceis sub-3-nerviis, nervis lateralibus tenuibus aut subnullis, pedicellis axillaribus subnudis striato-sulcatis-cephalis, invol. ♀ squamis ovali-lanceolatis acutis apice subciliatis. *DC.*—Chili. *Hænke.* "Folia fere *B. cuneifoliæ* aut *B. concavæ*, viscoso-nitida, 8-9-lin. longa, 4 lin. lata. Pedicelli bracteola 1-2 instructi, 7-9 lin. longi, involucraque pallida." We have seen no Chilian *Baccharis* which corresponds with this.

1066. (23.) B. *Patagonica* (*Hook. et Arn.*); glabra fruticosa, ramis angulatis junioribus viscidis, foliis sessilibus ovali-cuneatis crassis uninervibus punctato-rugosis superne 3-7-dentatis, pedicellis folio brevioribus axillaribus solitariis vel binis bracteatis monocephalis, involucri campanulati ♂ et ♀ squamis ext. ovatis enervibus, int. oblongis nervo viridi omnibus margine obscure fimbriatis.—Port Famine, Patagonia (*Capt. King's Voy.*). Cape Negro, Straits of Magelhaens. *C. Darwin, Esq.* (*n.* 356.)—Apparently a small shrub, with erect stout rigid branches, and leaves ¾ of an inch (scarcely more) long, in shape approaching those of the following, but of a far more coriaceous texture and wrinkled, with more teeth, but smaller, only one-nerved. In the bracteated pedicels it appears to approach the preceding species. Pappus, in the male plant, copious, tawny, very long.

1067. (24.) B. *incisa* (*Hook. et Arn.*); gracilis fruticosa glabra, ramis angulatis, foliis sessilibus ovalibus trinerviis (subtus conspicue) impresso-punctatis vix coriaceis basi sub-cuneatis apice inciso, 3-5-dentatis dentibus erectis, pedicellis solitariis axillaribus monocephalis nudis longitudinis dimidio folii, involucri ♂ 6-7-floris ovalis squamis paucis (7-8) ovatis uninervibus marginibus tenuiter membranaceis.—Uraguay. *Baird.*—Sent mixed with *B. axillaris*, but undoubtedly distinct. Leaves 5-6 lines long, almost exactly oval, rather acute than wedge-shaped, cut only at the apex into from 3

to 5 erect teeth. Lateral nerves on the upper side obsolete, beneath conspicuous and prominent. Pedicel of the capitulum about half the length of the leaf, quite destitute of bractea.

1068. (25.) B. *Bairdii* (*Hook. et Arn.*) arachnoideo-pubescens fruticosa, ramis erectis angulatis, foliis remotiusculis sessilibus subcoriaceis ellipticis basi cuneatis obtusis obscure trinerviis apice equaliter serratis, capitulis axillaribus solitariis sessilibus, involucri campanulati squamis ext. ovatis, int. oblongo-lanceolatis subuninerviis margine obscure fimbriatis. —Uraguay. *Baird.*—Difficult as it may be, in words, to describe correctly the varied forms of the leaves of this genus; those of this plant are very distinct from any others; they are almost exactly elliptical except at the base; and the apex only, or for not more than one-fourth of the way down, is moderately serrated with equal serratures. The capitula occupy the axils of several of the rather remote leaves in regular succession, and are completely sessile and constantly solitary. Pappus (female plants) tawny, half as long again as the involucre. Styles slightly exserted.

1069. (26.) B. *foliosa* (Gill. mst.); humilis subprostrata glaberrima, ramis brevibus angulatis copiose foliosis, foliis sessilibus oblongis coriaceis supra uninerviis subtus obsolete trinerviis (nervis utrinque exsculptis) basi cuneatis grosse regulariter serratis, pedicellis axillaribus solitariis monocephalis nudis longitudine fere foliorum, involucri squamis ovatis acutis uninerviis.—Cordillera of the Andes. *Dr Gillies,* (*n.* 167.) A small alpine shrub, the branches clothed with copious harsh leaves, scarcely an inch long. The flowers are in a very imperfect state, but the plant seems to be decidedly a *Baccharis* and very distinct in its characters.

1070. (27). B. *umbelliformis, DC. Prodr.* v. *p.* 410. "*Poepp. Pl. exsicc.* 860 and 695." Baccharis obovata. *Hook. et Arn. Bot. of Beech. Voy.* p. 30, (*non* Molina obovata *R. et Pav.*) Conception. *Beechey.*—The name of *obovata* being previously applied to a Peruvian *Baccharis* (Molina obovata, *R. et Pav.*) we gladly adopt that of De Candolle given to a *Baccharis* of

Poeppig (from Chili?) which by the description seems to accord sufficiently with our plant. The scales of the involucre indeed are not "dense ciliatæ," but in the var. β of De Candolle, they are described as "minus ciliatæ." The leaves of our plant are an inch and an inch and a half long, coarsely serrated from the apex to below the middle, in reality three-nerved, the lateral nerves are very flexuose and unite with the lateral nerves of the costa.

1071. (28.) B. *Poeppigiana* (*DC. Prodr.* v. *p.* 410); fruticosa glabra viscosa ramosissima, foliis obovatis basi cuneatis subsessilibus apice obtusis repando-dentatis, capitulis pedicellatis ad apices ramorum paucis umbellatis, invol. ♂ campanulati squamis lanceolatis vix apice subciliatis. *DC.*—"B. alaternoides, *Poepp. Pl. Chil. exs.* 2. *n.* 102," (*non Kunth*). Valparaiso. *Cuming.* (*n.* 793.) Quillota and Concon. *Bridges*, by whom it is marked as "*B. banksiæfolia*, Bertero."—If we are correct, as we think we are, in referring these plants of Cuming and Bridges to the *B. Poeppigiana DC.*, it is a plant which we have confounded with *B. concava*, from which it only differs in being not downy on the branches, (though the resinous particles often give them that appearance) and in the terminal heads of flowers being pedicellate and thus umbellate. We fear it is not really distinct. De Candolle compares it with *B. cuneifolia;* itself a very dubious plant.

1072. (29.) B. *concava* (Pers.); fruticosa ramosissima, ramulis angulatis pubero-velutinis (potius pulverulente resinosis, *H. et A.*), foliis late obovato-cuneatis apice obtuse trirarius quinquedentatis sessilibus (opacis) glabris crasso-coriaceis uninerviis summis circa capitula subcoriaceis, capitulis ad apices ramulorum 3—5 congestis subsessilibus, invol. campanulati squamis margine scariosis oblongis in ♂ obtusiusculis in ♀ inter. linearibus subacutis, acheniis compressis glabris. *DC. Prodr.* v. *p.* 411.—Molina concava. *R. et Pav. Syst. p.* 206.—Baccharis resinosa, *Hook. et Arn. Bot. of Beech. Voy. p.* 31. (*excl. Syn.*).—B. tridentata, *Poepp. Coll. Chil. n.* 211. (*non Vahl.*).—Chili. Valparaiso. *Bridges* (*n.* 54.).—In our specimens we do not find any difference between the scales of

the involucre in the male and female capitula. The name is a very bad one, and only tends to mislead.

1073. (30.) B. *myrsinoides* (Hook. et Arn.); fruticosa ramosissima, ramulis angulatis glabris, foliis sessilibus oppositis obovato-cuneatis coriaceis nitidis 3-nerviis superne dentatis rarius integerrimis impunctatis, capitulis glomeratis terminalibus brevi-pedicellatis vix umbellatis glomerulis inferne foliosis, involucri ♂ lato-cylindracei squamis enerviis integerrimis margine anguste scariosis ext. ovatis, int. oblongis.—Uraguay. *Tweedie* (*n.* 1000).—A small much branching glabrous shrub, with leaves like those of *Myrsine retusa*, glossy and opposite, and capitula as in *B. concava*, clustered, scarcely pedicellate, at the extremity of the branches.

1074. (31.) B. *Macraei* (Hook. et Arn.); fruticosa ramosissima, ramis teretibus dense pubescenti-tomentosis, foliis sessilibus obovato-cuneatis coriaceis uninerviis superne 3-rarius 5-dentatis junioribus glutinosis, capitulis sessilibus solitariis terminalibus, involucri ♀ parce puberuli campanulati squamis ext. ovatis interioribus lineari-oblongis uninerviis pappo duplo brevioribus.—Valparaiso. *Macrae.*—Leaves much resembling those of *B. concava*, but the branches are stunted, terete, densely downy tomentose, the capitula solitary, terminal, thrice as large as in the preceding species; the pappus much longer and more silky.

1075. (32). B. *rotundifolia* (Spreng.?) fruticosa, ramis teretibus, ramulis striato-angulatis subviscosis, foliis sessilibus obovato-subrotundis apice dentibus 3—5 repandis trinerviis coriaceis subtus præcipue albido-furfuraceis, capitulis ♂ ad apices ramorum congestis sessilibus, ♀ minus congestis subspicatis bracteis ♂ parvis obovatis, ♀ invol. subæqualibus tridentatis, invol. squamis ♂ ovato-lanceolatis acutis, ♀ magis elongatis vix acutis, acheniis striatis glabris.—Rio Grande, South Brazil, Fort Argentino, N. Patagonia. *Tweedie.* Monte Video. (*ex. Herb. Baldwin. Dr Torrey*).—If we are right in referring these several plants to *B. rotundifolia*, as we think we are, it is a most variable species. From Rio Grande (*Tweedie*) we have three specimens; in all the three, the nerves are distinct

and prominent on both sides of the leaves. In the male specimens, the lower leaves are orbicular and serrated about half way down, the upper are obovato-cuneate, 3—5-toothed at the apex, all are decidedly clothed (though not white) with small furfuraceous scales. In the two other specimens (female plants), the leaves are all obovate like the upper ones in the male plant and less furfuraceous. In our plant, (female) from Fort Argentino (*Tweedie*), the leaves are not furfuraceous, but obscurely dotted, narrow-obovate, coarsely 5—7 toothed, the nerves rather indistinct. In those (male) specimens from Monte Video, the nerves on the leaves are moderately conspicuous, the leaves themselves more coriaceous, more oval, indistinctly toothed, and the younger ones especially, rather glutinous than furfuraceous. The female pappus is scarcely longer than the involucre, in which respect it seems to differ from De Candolle's female plant; this however may be owing to the different ages.

1076. (33.) B. *Tweediei* (Hook. et Arn.); fruticosa glabra subviscosa, ramis angulatis, foliis coriaceis late obovatis basi cuneato-attenuatis subpetiolatis elevato-trinerviis varie angulato-dentatis integerrimisque, capitulis corymboso-paniculatis, corymbis foliosis subnudisve, involucri hemisphærico-campanulati squamis glabriusculis crispato-ciliatis uninerviis ext. ovatis, int. ovalibus acutiusculis.—Maldonado, S. Brazil. *Tweedie.* El Biscachera in the Pampas of Buenos Ayres. *Dr Gillies.*—In some respects the foliage of this plant resembles the last, but the leaves are generally larger and more attenuated at the base, so as to be almost petiolated. The inflorescence and involucres are quite different.

1077. (34.) B. *intermedia* (*DC. Prodr.* v. *p.* 411); fruticosa glabriuscula resinoso-subviscosa, foliis lineari-cuneatis basi attenuatis apice repando-dentatis margine subrevolutis, capitulis ad apices ramulorum congesto-corymbosis brevissime pedicellatis, invol. ♀ squamis ovali-lanceolatis vix acutis margine scariosis, achænio glabro striato.—Valparaiso. *Gaudichaud. Cuming* (*n.* 79.)—De Candolle places it next *B. concava*, and describes it as intermediate between it and *B.*

*rosmarinifolia* of the 3d section, in which he is certainly correct.

1078. (35.) B. *attenuata* (Don mst.); annua? erecta elongata stricta, ramis angulato-striatis, foliis plerisque oppositis coriaceis lanceolatis obscure trinerviis remote dentato-serratis basi attenuatis gracilibus subpetiolatis, capitulis glomeratis sessilibus vel pedunculatis spicas interruptas terminales formantibus, involucri campanulati squamis ext. ovatis, int. ovato-lanceolatis.—Pampas of Buenos Ayres. *Dr Gillies* (*n.* 174.) *Tweedie* (*n.* 1125), *Dr Baldwin* (*in Herb. Nostr.*) Uraguay. *Tweedie.*—Leaves 2—4 inches long, 3—6 lines broad. Pappus deep tawny, considerably longer than the involucre in the female plant. Dr Gillies describes the plant as having the odour of honey.—May this not be the same as *B. Platensis*, Spr. et DC. At any rate it should be placed between that and *B. subopposita*, DC.

1079. (36). B. *Tucumanensis* (Hook. et Arn.); fruticosa glabra, ramis erectis angulatis, foliis alternis subcoriaceis ellipticis lanceolatisque basi cuneatis in petiolum attenuatis oblique penninerviis (costa distincta nervis obscuris) acutis integerrimis vel (in latioribus hic illic dentatis), capitulis 4—6 ad apicem ramorum et in pedunculos axillares solitarios glomeratis, involucri lato-campanulati multifloris quamis ext. ovatis, int. lineari-oblongis, omnibus margine eroso-fimbriatis.—*α.* foliis latioribus subdentatis. Sides of the mountain St Xavier, Tucuman, just above the woods. *Tweedie* (*n.* 1099 and 1184).—*β.* foliis angustioribus fere omnibus integerrimis. Wood-sides of Tucuman. *Tweedie* (*n.* 1192).—This would seem to be a tall growing shrub, with leaves three inches and more long, scarcely dotted. Peduncles two inches and more long, bearing glomerules of capitula at the extremity, naked, or occasionally with one or two leaves.

1080. (37). B. *daphnoides* (Hook. et Arn.); fruticosa glabra, ramis angulatis, foliis alternis ellipticis obtusiusculis transversim obscure penninerviis basi cuneatis in petiolum brevem attenuatis margine omnino integerrimis tenuiter revolutis supra coriaceis subtus obscure squamuloso-punctatis, corymbis

axillaribus pedunculatis foliosis bracteatisque foliis quam in caulinis multo brevioribus, involucri campanulati (masc.) multiflori squamis uninerviis subpuberulis ciliato-fimbriatis ext. ovatis, int. oblongis.—Uraguay. *Baird*.—Leaves two inches long and one broad, perfectly entire. Corymbs copious, about as long as the cauline leaves (including the peduncle) much longer than those of the peduncle, which gradually pass into small bracteas on the pedicels. Male pappus white, clavate.

1081. (38). B. *bracteata* (Hook. et Arn.); fruticosa patenti-ramosa, ramis angulatis junioribus pubescentibus, foliis patentibus alternis sessilibus subcoriaceis opacis lanceolatis acutis basi attenuatis utrinque impresso-punctatis uninerviis integerrimis v. hic illic denticulo instructis, capitulis pedicellatis in apices ramorum vel in ramos proprios bracteatos dispositis, in singula axilla solitarios et ita racemos foliosos simulantibus, involucri lato-campanulati pubescentis squamis uninerviis fimbriato-ciliatis ext. ovatis, int. oblongis.—Rio Grande. *Tweedie*.—Branches spreading, slender. Leaves an inch to an inch and a half long, generally quite entire, occasionally with a solitary tooth on one or on both sides, opaque, distinctly impresso-punctate on both sides, single nerved. Capitula (male) solitary, pedicellate in the axils of numerous small leaves or bracteæ, at the extremity of the common branches or on peculiar branches, so that they form leafy or bracteated racemes, and are longer than the bracteæ when in full flower.

1082. (39). B. *arguta* (Gill. mst.); fruticosa, ramis angulatis pubescentibus, foliis ovatis subcoriaceis oblique penninerviis profunde spinoso-serratis acutis basi sublonge cuneato-attenuatis supra glabris subtus pubescenti-scabris nervis valde elevatis, corymbis terminalibus nudiusculis, involucri campanulati squamis ext. ovatis, int. lineari-oblongis margine scarioso-fimbriatis.—Puente de Marquez, Buenos Ayres. *Dr Gillies*.—Habit of *B. racemosa* (*n*. 2.) but the leaves are not 3-nerved, all of them obliquely penninerved, and they are much attenuated, almost petiolated at the base.

This and the three preceding species, and even *B. attenuata*,

do not properly belong to this section, but on account of their attenuated or cuneate bases they are placed here rather than in the following division. Even in those species with generally cuneate leaves, they are often seen to vary with oblong and even lanceolate ones.

§ 3. Oblongifoliæ, *nempe foliis oblongis ovalibus linearibusve glabris aut rarius villosis uni- aut penninerviis non distiche imbricatis, ramis apteris. DC.*

1083. (40). B. *petiolata* (*DC. Prodr.* v. *p.* 408); glabra herbacea erecta ramosa, ramis teretibus apice subglandulosis, foliis petiolatis ellipticis grosse dentatis, corymbis pedunculatis nudis compositis, involucri ♂ campanulati squamis ovato-lanceolatis subacutis.—Chili. *Hænke.*—"Species distinctissima. Petioli sesqui- aut bilineares. Limbus folii 10 lin. longus, 4—5 latus."—Quite unknown to us.

1084. (41). B. *Chilquilla* (*DC. Prodr.* v. *p.* 419); fruticosa, junior pulverulento-puberula dein glabra subviscosa, ramulis teretiusculis, foliis linearibus elongatis sessilibus acutis hinc inde grosse dentato-serratis aut integerrimis subuninerviis, corymbo terminali polycephalo, involucri ♂ ovati squamis scariosis stramineis glaberrimis ovali-oblongis subobtusis.—Quillota, Chili. *Bertero.* "Vulgo 'Chilquilla del Rio.' Folia 3—4 poll. longa, sesquilin. lata. Affinis *B. marginali.*"

1085. (42). B. *paniculata* (*DC. Prodr.* v. *p.* 419); fruticosa ramosissima, ramis erectis glabris angulatis, foliis linearibus v. lineari-lanceolatis utrinque subacuminatis integerrimis subcarnosis siccitate dorso carinatis supra obsolete trinerviis apice uncinatis nunc (latioribus) margine revolutis, paniculis copiosis elongatis foliosis subpyramidatis, involucri campanulati squamis ext. ovatis, int. oblongo-linearibus acutis uninerviis marginibus obsolete eroso-fimbriatis.—Molina linearis. *R. et P.?*—Baccharis paniculata. *DC. Prodr.* v. *p.* 420. B. rosmarinifolia. *Hook. et Arn. Bot. of Beech. Voy. p.* 30.—Chili, frequent. Valparaiso. *Bridges* (*n.* 57). *Macrae. Cuming* (*n.* 791). Conception. *Beechey.*—Having received this from Chili under the vernacular name of "Romera," we are in-

clined, on that account, and because it is "fruticose," to consider the *Molina linearis* of Ruiz and Pavon, rather than *B. Pingræa*, (to which De Candolle refers it) to be the same with this plant. We are, however, sure that it is the *B. paniculata* of De Candolle, and we think it safer to preserve that name to it. On the closest examination, indeed, we do not find the leaves to be ever serrated, or otherwise than entire: they are very constantly linear or linear-lanceolate, of a thickish and fleshy character, when dry, at least, carinated at the back, channelled above, and a depressed line will be seen on each side the indistinct costa in the broader ones, indicating a 3-nerved leaf. The flowers or capitula are copious on the very numerous erect branchlets, thus forming a leafy panicle upon every large branch.

1086. (43). B. *paucidentata* (*DC. Prodr.* v. *p.* 420); fruticosa ramosissima glabra, ramulis striato-angulatis, foliis sessilibus linearibus aut lineari-oblongis utrinque acutis uninerviis aut ima basi subtrinerviis integerrimis aut dente 1—2 utrinque notatis, capitulis ♀ ad axillas superiores subsessilibus et ideo in spicas breves digestis, involucri squamis lanceolatis acutis margine membranaceis, floribus in invol. circ. 10, achæniis striatis glabris.—β. capitulis paucioribus.—Rio Grande (*De Candolle*). Los Loamos of Bahia blanca, N. Patagonia. (α. and β.). *Tweedie.* El Rio quarto, province of Cordova, and β. Buenos Ayres. *Dr Gillies.*—The leaves of our plant are too narrow to be considered as approaching to oblong, the teeth are large and spreading, the involucres moderately large, in the female plants almost cylindrical.

1087. (44). B. *coridifolia* (*DC. Prodr.* v. *p.* 423); fruticosa erecta, ramis striatis puberulis, foliis linearibus integerrimis mucronatis uninerviis subtus utrinque obscure 1-striatis marginibus scabris, capitulis in ramulis gracilibus foliosis racemosis, involucri (♂ hemisphærici) ovati ♀ squamis herbaceis apice membranaceis ovatis obtusissimis, int. longioribus multoque latioribus.—South Brazil, and woods of Cordova. *Tweedie.*—The scabrous margins of the exactly linear entire leaves, and the unusually herbaceous nature of the scales of

the involucre, together with the greater size and breadth of the inner scales, will readily distinguish this species. The male capitula, as De Candolle justly remarks, are small, almost globose and drooping, very much resembling some species of *Artemisia;* those of the female plant are larger, erect, with long tawny pappus.

1088. (45). B. *Megapotamica* (Spreng.); fruticosa glabra ramosissima, ramulis angulatis, foliis linearibus acutis integerrimis margine subrevolutis eciliatis uninerviis, capitulis ad axillas foliorum suprem. solitariis sessilibus in spicam dispositis, involucri (♂ ovati, ♀ subcylindracei) squamis paleaceis ext. ovatis, int. lineari-oblongis elongatis.—*DC. Prodr.* v. *p.* 422.—β. foliis obtusis.—Rio Grande (Spreng.) *Tweedie* (*n.* 990, 992).—β. S. Brazil. *Tweedie* (*n.* 999, 1000).—A small copiously leafy shrub. Leaves ¾ of an inch long. In our plants the pappus of the female flowers is longer than the involucre, and the capitula are often pedicellate.

1089. (46). B. *thymifolia* (Hook. et Arn.); fruticulosa glutinosa nana, ramis pubescentibus striatis, foliis parvis lineari-oblongis obtusis integerrimis crassiusculis patenti-reflexis enerviis, capitulis racemoso-paniculatis, pedicellis basi foliolosis, involucri ♂ squamis subhemisphæricis paucis lineari-oblongis, int. paulo longioribus.—Crevices of rocks, Cienega de las Arrojas, Andes of Mendoza. *Dr Gillies* (*n.* 166).—A very distinct and well marked species, with copious glutinous leaves, 2—3 lines long.

1090. (47). B. *ulicina* (Hook. et Arn.); fruticosa ramosissima, ramis erectis striatis glabris, foliis angustissimis subulatis tenui-mucronulatis integris pinnatifidisque supra canaliculatis laciniis subulatis, capitulis solitariis, ramulis brevibus sæpe corymbosis terminantibus, involucri subcampanulati squamis lineari-subulatis nervo viridi notatis.—β. *humilis.* Woods of Cordova (*n.* 1123), and in N. Patagonia; and β. dry bare places of the Pampas (*n.* 1118). *Tweedie.*—Leaves ½ to ¾ of an inch long, most of them deeply pinnatifid, with long slender mucronate segments, by which characters this remarkable species may at once be recognised.

1091. (48). B. *subulata* (Don. mst.); herbacea glabra simplex vel ramosa, caule ramisque teretibus lævibus aut lævissime striatis, foliis erectis subcarnosis alternis remotis lineari-subulatis acutis subenervibus integerrimis v. serratis siccitate canaliculatis, capitulis solitariis terminalibus in ramulos ultimos subcorymbosos, involucri campanulato-hemisphærici foliolis coloratis omnibus ovatis acuminatis margine anguste scariosis. —*α*. foliis involucrique squamis integerrimis.—*β*. foliis serratis involucri squamis margine erosis.—*α*. Buenos Ayres (*Herb. Baldwin*). Boggy places, Bahia Blanca, N. Patagonia. *Tweedie* (*n*. 400). Wet spots, near the mouth of Rio de Uspallata, Andes of Mendoza. *Dr Gillies* (*n*. 190).—*β*. S. Patagonia, Lat. 47°. *C. Darwin*, *Esq*.—Evidently an annual plant, varying in height from six inches to two feet, the stems and branches singularly rounded and even, thickish and junciform, spongy within. Leaves always remote, one to nearly two inches long, erect and frequently appressed, slightly fleshy, generally with no appearance of costa or nerve. Capitula large. It is the same species detected by Dr Gillies in the Andes of Mendoza which Mr Tweedie finds upon the coast of Patagonia. It is readily distinguished by the nature of its stem and leaves, and the beautiful coloured (purple) acuminated scales of the involucre with frequently white silvery margins. Pappus an inch long, tawny.*

1092. (49). B. *Darwinii* (Hook. et Arn.); suffruticosa erecta puberula, ramis angulato-striatis, foliis remotis linearibus canaliculatis subcarnosis obscure uninerviis integerrimis pilo vel mucrone molli terminatis, capitulis solitariis terminalibus in ramulos ultimos subcorymbosos, involucri hemisphærici squamis obsolete uninerviis lanceolatis acuminatis marginibus late scariosis integerrimis.—Port Desire, lat. 47°. *C. Darwin*, *Esq*. (*n*. 397.)—Our specimens are small, and do not exhibit the lower part of the plant, but they suffice to show that the species is very distinct from any other. Leaves an inch long.

* May this not be the *Stephananthus junceus*, Lehm. (*Baccharis juncea*, DC. l. c. p. 423), which Lessing says is a native of South Brazil, and not of "Egypt;" the character agrees tolerably well.

1093. (50). B. *genistifolia* (*DC. Prodr. v. p.* 423); fruticosa ramosissima glabra, ramulis striatis, foliis (perpaucis) distantibus sessilibus linearibus obtusis integerrimis subenerviis, capitulis ♂ ad apices ramulorum 3—5 sessilibus spicato-digestis (sub-) ebracteatis (nunc solitariis terminalibus), involucri ♂ subcampanulati squamis ext. ovatis, int. oblongis, ♀ cylindraceis quamis ext. ovatis, parvis int. lineari-oblongis, omnibus uninerviis integerrimis.—*An etiam* B. leptophylla. *DC. Prodr.* v. *p.* 423.—*α.* capitulis glomeratis bracteatis.—*β.* capitulis terminalibus solitariis ebracteatis (an distincta?).—*α.* Monte Video and S. Brazil (*n.* 988). Fort Argentino, N. Patagonia. *Tweedie.* —*β.* Buenos Ayres. *Tweedie.*—Allied to *B. angustifolia* Mx. next to which De Candolle properly places it. May not *B. aphylla* DC. l. c. p. 424, be a leafless var. of this? Pappus elongated, lax, stramineous. In the glomerated var. the female capitula have the involucre much longer, and the inner scales particularly, than the specimens with solitary capitula. It will perhaps prove to be a distinct species.

§ 4. Discolores, *foliis uninerviis ramis penninerviis, supra magis minusve virescentibus, subtus dense cano-tomentosis v. sericeis, ramis apteris.*

1094. (51.) B. *gnaphalioides* (*Spreng. Syst. Veget.* iii. *p.* 461.) fruticosa subramosa, ramis teretibus albo-tomentosis, foliis linearibus patentibus mucronato-acutis uninerviis integerrimis margine revolutis supra araneosis (demum glabris nitidis) subtus albo-tomentosis, capitulis terminalibus racemosis, involucri hemisphærici squamis ovatis acutis dense tomentosis.—*DC. Prodr.* v. *p.* 415. Rio Grande, *Sello.* Maldonado. *Dr Gillies.* Monte Video. *Tweedie.*—Capitula rather large. Pappus pale tawny. De Candolle describes the leaves which are nearly an inch long, as obtuse, but they are characterized by Sprengel as acute, and even mucronate.

1095. (52.) *B. velutina* (*DC. Prodr.* v. *p.* 415); fruticosa ramosa tota molliter velutina, ramulis teretibus, foliis sessilibus linearibus (obtusis) integerrimis 1-nerviis margine subrevolutis, capitulis ♀ ex axillis breviter pedicellatis racemosis pedi-

cellis nudis, invol. squamis oblongis ♀ ex axillis longius pedicellatis, pedicellis bracteolatis, invol. squamis ovatis obtusissimis laxis rufo-velutinis, floribus in ind. ♀ 5-6, achæniis glabris, corolla rigida pappo pluriseriali. *DC.*—B. ochracea, *Spr.*?—Maldonado. *Tweedie.*—Leaves 4-6 lines long, patent or reflexed. In our specimens the younger ones only are wholly tomentose, in the older ones the upper side is more or less bare, the under always densely velutino-tomentose, the involucre thickly so and ferruginous. Our plants are all male, and the capitula, at first sight, resemble those of *Artemisia Absinthium;* the scales are short, oval, very obtuse, lax and somewhat spreading. De Candolle doubts if the male and female plants he has described belong to the same species, perhaps the following has been confounded with it.

1096. (53.) B. *artemisioides* (Hook. et Arn.); fruticosa ramosissima cano-pubescens, ramis ramulisque angulato-striatis, foliis numerosissimis lineari-subacicularibus mucronato-acutis uninerviis subtus albo-tomentosis marginibus revolutis, capitulis racemoso-spicatis foliosis, involucri campanulati (♂ subhemisphærici) squamis dense pubescenti-incanis, ext. ovatis, int. oblongis obtusis, omnibus apicibus scariosis.—Between Rio de los Ehovillos and el Rio Quinto, province of San Luis. *Dr Gillies* (*n.* 185.) Salt Plains of Bahia Blanca, lat. 40°. in N. Patagonia, and in high and dry places of Cordova. *Tweedie* (*n.* 1126.)—Leaves 4-6 lines long, very slender, almost acicular, scarcely rigid. Capitula rather small. Pappus twice as long as the involucre, rufous.

1097 (54.) B. *phylicæfolia* (*DC. Prodr.* v. *p.* 415); fruticosa, ramis teretibus junioribus canescentibus velutino-hirsutis, foliis sessilibus approximato-patentibus ovato-oblongis basi obtusis subcordatis, apice obtusiusculis submucronulatis margine vix subrevolutis supra glabris subtus cano-tomentosis, panicula subnuda ramosissima apice subcorymbosa, capitulis pedicellatis, involucri ♂ squamis oblongo-linearibus obtusis dorso lanato-hirsutis. DC.—Sandy places of Rio Grande, and the Banda Orientale. *Tweedie* (*n.* 1023.)

1098. (55.) B. *albida* (Hook. et Arn.); tota albido-canes-

cens, ramis angulatis, foliis remotis lineari-elongatis acutissimis submucronatis subtus præcipue dense albo-pubescentibus, capitulis corymbosis, involucri subhemisphærici squamis lanceolatis acutis uninerviis dorso albo-pubescentibus reliquis nudis subscariosis.—Santa Fée (in the Argentine Republic?) *Tweedie.*—Our specimen is a solitary one, and the flowers (male) scarcely perfect: but it seems very distinct.

1099. (56.) B. *tenella* (Hook. et Arn.); tota pubescenti-incana suffruticosa, ramis angulatis, foliis alternis remotis lineari-subulatis integerrimis acutis rigidiusculis obscure uninerviis, capitulis terminalibus solitariis majusculis, involucri lato-campanulati squamis ovatis acutis imbricatis apicibus nudis coloratis—*α. gracilior.* N. Patagonia, at Bahia Blanca and Arroya de Napoota. *Tweedie.*—*β. magis robusta.* St Julian (S. Patagonia?) *C. Darwin, Esq.* (n. 379.)—Our plants are all males.

§ 5. Caulopteræ, *nempe foliis oblongis linearibus aut subnullis, ramis alas foliaceas e foliorum basi utrinque decurrentes gerentibus.* DC.

1100. (57.) B. *Gaudichaudiana. DC. Prodr.* v. *p.* 424. St Catharine, Brazil. *Tweedie.* Rio Grande do Sul. *Isabelle.*—De Candolle says, "this very much resembles *B. articulata*, but it is not glaucous; the articulations are elliptical and broader, 7-8 lines long and 3 lines wide." Some of our specimens are most beautifully and regularly jointed like an *Opuntia*, but others pass gradually into the following species.

1101. (58.) B. *articulata. Pers.*—*DC. Prodr.* v. *p.* 424. Conyza. *Lam.* Molina, *Less.*—Monte Video. *Sello.* Rio Grande. *Tweedie.* Maldonado and the Pampas of Buenos Ayres. *Gillies*, and N. Patagonia. *Tweedie.*—El Morro, Province of San Luis. *Dr Gillies.*—Nothing can be more variable than this plant (which however, can hardly be called glaucous) in the length of its articulations, the breadth of the wings, often having a waved edge, and the number (2-4) and more or less crowded position of the capitula: so that we think it possible that the number of described species in this section will require to be greatly reduced, and that probably

*B. crispa*, Spr. *B. trimera*, Less. and *B. cylindrica*, Less. (all from Rio Grande) should be united with *B. articulata*.

1102. (59.) B. *sagittalis*. *DC*. v. *p*. 425. Molina, Less.—Chili. *Chamisso*. Plains near the Andes, province of Valdivia. *Bridges*. (*n*. 580) Chiloe (*n*. 57) and Coquimbo (*n*. 83.) *Cuming*. Mendoza, *Gillies* (*n*. 182.) Parana, *Tweedie*.

1103. (60.) B. *phyteumoides*. *DC. Prodr*. v. *p*. 425. Molina, *Less*.—S. Brazil. *Sello*. Banda Orientale, Rio Parana and Uraguay and Buenos Ayres. *Tweedie*.—In our plants the leaves are from 2 to 4 inches long, triplenerved, and penninerved. The glomerules of capitula form dense spikes.

1104. (61.) Heterothalamus *brunioides* (*Schlecht. in Linnæa v*. 6. *p*. 504); foliis linearibus integerrimis. *DC. Prodr*. v. *p*. 216.—Melananthera aliena. *Spr*.—Sterea Romerilla. *Don, mst*.—Mountains west of Monte Video. (*Tweedie*). Aguadita and El Cerro del Morro, province of San Luis. *Dr. Gillies*. (*n*. 163.)

1105. (62.) H. *spartioides* (Hook. et Arn.); ramosissimus aphyllus, rachidis bracteolis caducis, floribus fœmineis ligulatis.—Baccharis ligularis. *Don, mst*.—Los Loamos in N. Patagonia. *Tweedie*. Valley of Uspallata and from Mendoza to Rio Desaguadero. *Gillies* (*n*. 188.) Coquimbo, Chili. *Cuming*. (*n*. 884).—Habit of *Baccharis genistifolia*, but it has no leaves, and the flowers are decidedly bracteolated. No doubt, also, it greatly resembles *B. aphylla* of DC. Prodr. v. p. 424, for De Candolle has referred to it, though doubtfully, Mr Cuming's Chilian specimen. Even in a dried state, on bruising the flowers, they yield a most powerful balsamic smell, and Tweedie observes, "I was led to discover this plant from a considerable distance, by its very strong odour. It grows in small dense tufts, and when the wind blows the scent is perceived far and wide. It is called Escoba, and is the only article employed for making brooms."

1106. (63.) H. *trinervis* (Hook. et Arn.); ramulorum foliis oppositis petiolatis ovato-lanceolatis integerrimis trinerviis supra nitidis, panicula terminali pyramidata, rachidis bracteolis caducis, flosc. fœm. filiformibus (haud ligulatis!)

—Conyza trinervis, *Lam.* Baccharis trinervis, *DC.*—Uraguay. *Tweedie.*—This differs from the generic character only in the female florets not being ligulate. In all other respects it approaches *H. psidioides*, Less. It is surely *Baccharis trinervis*, Pers. and De Cand.

Subtrib. III. Tarchonantheæ. *Less.*

Micropsis. *DC.*

(Lasiophyton. *Hook. et Arn. mst.*)

*Involucrum* scariosum subbiseriale. *Capitulum* heterogamum pauci-(sub-9-)-florum; flosculis fœmineis uniserialibus filiformibus in ambitu: *fl. hermaphroditis* tribus tubulosis in centro intra rachidis uniseriales isarithmas dispositis. *Antheræ* basi bisetosæ. *Stylus* herm. rami pube infra apicem decurrente obsessi. *Achænia* estipitata erostria oblonga; *fœm.* sericeo-villosa, villis pappum occultantibus; *herm.* glabra compressiuscula, hinc linea sericea notata, bracteolis membranaceis valde concavis apice scarioso-appendiculatis dorso gibbis omnino involuta. *Pappus* conformis coroniformis brevissimus crenato-dentatus persistens.—*Herba annua, pygmæa, albo-tomentosa.* Folia *oblongo-spathulata.* Capitula *glomerata, terminalia, foliis sub capitulis involucrata. Hook. et Arn.*

1107. (1.) M. *nana* (*DC. Prodr.* v. *p.* 460.) Lasiophyton pusillum. *Hook. et Arn. mst.*—Chili. Valdivia. *Bridges* (*n.* 642). Quillota. *Bertero.*—We have placed this genus here in deference to the opinion of De Candolle, although our observations on the style of the central florets, which that eminent botanist has described as male, lead us rather to insert it among the *Gnaphalieæ*, near *Gifola.*

1108. (1.) Micropus *globiferus* (*Bert. in De Cand. Prodr.* v. *p.* 460); totus niveo-tomentosus, caulibus a basi ramosis diffusis, foliis oblongo-linearibus, floralibus latioribus obtusis, capitulis terminalibus lateralibusque invol. squamis planiusculis inermibus tomentosis obtusissimis.—Chili, at Rancagua.—*Bertero.* We are unacquainted with this.

## PLUCHEA. *Cass.*

1109. (1.) P. *macrocephala* (*De Cand. Prodr.* v. *p.* 450); herbacea erecta simplex pilosa, caule striato, foliis longe decurrentibus alatis infer. ovali-oblongis serratis basi longe attenuatis, super. lanceolatis linearibusve integerrimis, capitulis 7—8 in corymbum terminalem dispositis, pedicellis patentim hirsutis, involucris tomentoso-lanatis hirsutissimisque.—Conyza Megapotamica. *Spr.*—α. caule angusto elato. Rocks Via Monte and Rio Grande. *Tweedie.*—β. caule lato-alata. Boggy ground near Maldonado. *Tweedie.*—Caulis mono-polycephalus.

1110. (2.) P. *Quitoc* (*DC. Prodr.* v. *p.* 450); herbacea, foliis sessilibus longe in alas foliaceas decurrentibus oblongis lanceolatisve calloso-denticulatis, corymbo composito subfastigiato, invol. squamis lanceolatis subacutis.—Rio Grande, Mato-Grosso, ubi dicitur "Quitoc." *Lund,* (*De Cand.*) *Tweedie.* N. Patagonia. *Tweedie.*

1111. (3.) P. *oblongifolia* (*De Cand. Prodr.* v. *p.* 451); herbacea subfusco-pubescens subglutinosa, foliis basi longe decurrenti-alatis vel junioribus obtuse truncatis sessilibus serratis venoso-reticulatis, corymbo terminali subcomposito, invol. squamis dorso puberis glandulosis lanceolatis acuminatis disco longioribus.—Victoria, S. Brazil. *Tweedie.*—Our plant seems shrubby; in the young branches the leaves are sessile and obtuse at the base, in the older ones singularly decurrent.

1112. (1.) Pterocaulon *spicatum* (*DC. Prodr.* v. *p.* 454). Conyza spicata, *Lam.* C. rugosa, *Vahl.* Chlænolobus, *Cass.*—Buenos Ayres, Rio Grande and Maldonado. *Tweedie.*

1113. (2.) Pt. *angustifolium* (*DC. Prodr.* v. *p.* 454).——Buenos Ayres. *Tweedie.*—Here the glomerules of capitula form a dense globose head, which seems the only difference between it and *Pt. spicatum.*

1114. (1.) Tessaria *absinthoides* (*DC. Prodr.* v. *p.* 457); ramis foliisque adpressissime canis subargenteis, foliis lanceolatis utrinque acuminatis, nunc integerrimis, nunc dentibus

grossis acutis hinc inde incisis, subtus nervoso-reticulatis, invol. squamis glabris acutis, disco 7—8-floro. *DC.*—Baccharis absinthoides. *Hook. et Arn. Bot. of Beech. Voy. p.* 57. Gyneteria incana, *Spr.*—Chili. Conception. *Beechey. Cuming.* (*n.* 822.). Valparaiso. *Bridges* (*n.* 55.) Mendoza. *Dr Gillies.* ("*Paxaro—Bobo,*" vern. *n.* 173.). Monte Video and Banda Orientale, and sides of Rio Petombolo. *Tweedie* (*n.* 1209.).—We have adopted, following De Candolle, the Genera *Pluchea, Pterocaulon,* and *Tessaria;* they differ in habit, but are scarcely distinguishable by any characters. The present plant does not belong to *Tessaria,* as defined by Lessing; but to his *Pluchea.*

### Subtrib. IV. Eclipteæ. *Less.*

1115. (1.) Siegesbeckia *serrata* (*DC. Prodr.* v. *p.* 496); foliis ovatis acutis regulariter dentato-serratis breviter petiolatis, summis sessilibus ovato-lanceolatis ciliatis, invol. ext. squamis interiore duplo longioribus, *DC.*—S. cordifolia, *Poepp. Diar. Herb. n.* 55. *Hook. et Arn. mst.* (an H.B.K.?) —Chili. *Chamisso.* Between Valdivia and Los Uanos, Province of Valdivia. *Bridges* (*n.* 689). Woods of Tucuman. *Tweedie* (*n.* 1239.)—De Candolle says of this, "Differre videtur a *S. cordifolia,* petiolo semipoll. nec 3-pollic., limbo ovato nec cordato, inv. ext. squamis brevioribus;" but these differences do not appear to us to be constant.

1116. (1.) Eclipta *erecta* (*DC. Prodr.* v. *p.* 490.)—Rio St Lucia, and banks of the Uraguay, Banda Orientale, and St Catharine, S. Brazil. *Tweedie* (*n.* 450.)

### Subtrib. V. Melampodieæ. *Less.*

1117. (1.) Polymnia *silphioides* (*DC. Prodr.* v. *p.* 516); caule tereti puberulo-glanduloso, foliis oppositis alternisve membranaceis puberulis triplinerviis grosse dentatis apice subtrilobis basi in petiolum alatum irregulariter dentatum attenuatis prope basin auriculato-dilatatis, inv. squamis ext. ovatis acutis dorso villosis, achæniis obovatis subcompressis, ligulis linearibus integris *DC.*—Rio Grande (*De Cand.*)

*Antoine Laurent de Jussieu*

La Plata and Parana. *Tweedie.*—Our specimens from Mr Tweedie are indifferent, yet we think we are right in referring his plant to ***P. silphioides.***

1118. (1.) Euxenia *grata* (*Cham. Hor. Phys. Berol. p.* 75, *t.* 16); foliis late ovatis in petiolum non decurrentibus. *DC. Prodr.* v. *p.* 501. *Hook. et Arn. in Beech. Voy. p.* 57. Ogiera triplinervia, *Spr.* Podanthus ovatifolius, *Lag.*—Conception. *Beechey. Cuming.* (*n.* 131).

1119. (2.) E. *Mitiqui* (*De Cand. Prodr.* v. *p.* 501); foliis ovali-lanceolatis basi longe cuneatis apice acuminatis medio grosse serratis. *DC.*—Podanthus Mitiqui. *Lindl. in De Cand. Prodr. et in Herb. nostr.*—Chili. *Lindl.* Valparaiso. *Bridges* (*n.* 496). Buenos Ayres and Entro Rios (cultivated) *Tweedie.*—De Candolle notices a *var. β, subintegerrima,* of this species, which is the *Græmia aromatica,* Poepp. Pl. Exsicc. n. 208. (non Hook.), a native also of Chili.

1120. (1.) Acanthospermum *xanthoides* (*DC. Prodr.* v. *p.* 501.)—Centrospermum xanthoides, *H.B.K. Nov. Gen. Am.* iv. *p.* 271. *t.* 397.—Salt plains of Buenos Ayres (*n.* 739), and at Cordova (*n.* 1127). *Tweedie.*

*(To be continued.)*

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## IV.—*Historical Eulogium on the late* M. A. LAURENT DE JUSSIEU; translated from the French of M. FLOURENS, Perpetual Secretary to the Academy of Sciences.

[*With a Portrait.*]

THE Jussieu family belongs originally to the little town of Montrolier, situated amid the mountains of the Lyonnais. One member of this family came to settle at Lyons towards the year 1680, there to practise Pharmacy. He married, and was the father of sixteen children, three of whom, Antoine, Bernard, and Joseph de Jussieu, have been the most celebrated Botanists of the 18th century.

The eldest of all this numerous and gifted family was called

Christopher; from him descended M. Laurent de Jussieu, who was destined to have the happiness of adding new credit to the name which his father and uncles had transmitted to him, and the no less rare felicity of handing it to a successor adapted to support its honour; a family in which the genius of Botany seems to have been hereditary for now nearly two centuries, as was the spirit of mathematics during a long series of years in that of Bernouilli.

Antoine de Jussieu, with whom commenced the celebrity of the name and the taste for Botany, was a Botanist almost from his infancy. Before he attained to fourteen years of age, he had investigated while herborizing, the environs of Lyons and the adjoining provinces of the Lyonnais. At eighteen, he studied in Montpellier under Magnol, who was already proposing tbe names of *Families*, (a happy term, though then little understood,) of *Affinities*, and (so to speak) of *Parentages of Plants*, and at twenty-four, he succeeded to Tournefort, the greatest botanist of his own time, and perhaps of any time, because it was he who first fixed the constitual ideas of the science of Botany, as Linnæus, at a later period, settled its nomenclature.

Compelled to devote himself to the practice of medicine in which he excelled, Antoine did not continue to effect for Botany all that his facile and singularly precocious genius had seemed to promise. But in summoning to him his second brother Bernard, he did more for this science than his own entire and undivided attention could probably have performed.

After Bernard, he sent for Joseph, whose life was to be as perturbed as his brother's should be calm, and who set off for Peru in 1735. He accompanied in his capacity of botanist, the astronomers whom the Academy was then sending, that they might measure at the equator a degree of the meridian, and thus resolve by definitive experiment, the famous and long-debated question of the configuration of the earth. Joseph is an additional example of all the courage and patience which is inspired by devotion to science, which

already reckons so many victims, and enumerates them in nearly all parts of the world, a kind of heroism almost peculiar to modern times. Detained at first by the curiosity that such rich and novel regions might well inspire, subsequently hindered from departing by the natives of the country, who being attacked by a severe epidemic, were most unwilling to lose the services of an able physician, he did not revisit the land of his birth till after thirty years of the severest fatigues, when worn out alike in body and mind, having even lost all recollection of what he had done, he too well justified by his labours and misfortunes the title that Condorcet bestowed upon him of *the Martyr to Botany*.

Of these three brethren, the only one who exercised a powerful influence on Botany, and through Botany on Natural History in general, was Bernard. He it was who, while all the other French botanists, beginning by his brother Antoine, were timidly following the traces of Tournefort, opened to himself a new path in which there was no predecessor, and in which none was to go farther than his nephew, M. Laurent de Jussieu, the subject of the present memoir.

Antoine Laurent de Jussieu, the nephew and worthy follower of Bernard, was born at Lyons, the 12th April, 1748. As soon as he had completed his earlier studies, his uncle sent for him to Paris, where he arrived in 1765, at seventeen years of age. Thus did he find himself at once placed beside the individual who had swayed the sceptre of Botany in France ever since the time of Tournefort, and whose only European rival was Linnæus,—a wonderful man, whose name was filling the learned world, and who had written nearly nothing. But if Bernard de Jussieu had written little, he had thought much; he had passed his life in meditating on one of those questions which unravel all the other questions of a science; he solved the problem of the *Method* in Natural History, and had done so during a period when efforts of all kinds had strikingly advanced the human mind.

At the time when the younger Jussieu came to his uncle, Antoine had just died; Joseph was yet in Peru, and the illus-

trious old man was living nearly alone, lodging in a small house in the street des Bernardines, which he only quitted to go to Mass, to the *Academy*, and to the *Jardin des Plantes*, and absorbed in profound meditations which were only interrupted, (if interruption it may be called), by the society of a few friends chosen from among the most respected names of that epoch, Le Poivre, Le Monnier, Duhamel, and Malesherbes.

Such was the retired life of Bernard. To this simplicity of manners, and love for a continuous train of thought, in which by the peculiar turn of his mind, he rather admitted the ideas which arose, than sought for them, he added the strictest and exactest regularity in all his habits. Every thing in his house was done with extreme order, in a *spirit of method* so to speak, of the most unerring kind; daily, at the same hour, and after the same fashion, had each meal its fixed and invariable time; supper was regularly served at nine; and when the young Laurent ventured on rare occasions to indulge himself in a visit to the theatre, he never failed to calculate the precise number of minutes which it should require for him to enter the eating-room by one door precisely at the instant when his uncle was coming in at the other. A trifling circumstance exhibits another trait of Bernard's character. That portion of his income which was not required for his running expenses, he deposited in a chest. One day, being called upon to incur a large and extra expense, he opened this chest and found in it 40,000 francs; it was then closed not to be reopened till after his death, when about an equal sum was discovered there.

It is no unfair allegation to say that Bernard de Jussieu treated his ideas much as he did his money. With the same regularity and continuity, yet with a degree of carelessness did he accumulate them; at length, dipping into the treasures of his mind one happy day, he drew thence his plan for the *Natural Orders*, an undying proof of his genius; again he let them gather up, and at his decease bequeathed these ideas to his nephew, as the most valuable part of his inheritance.

Bernard passed most of his time in thought, and habitually meditated in a sitting posture. The uncle and nephew spent the day at work in the same apartment without speaking to one another; but in the evening, the young man read what he had written to his uncle, who in his turn communicated to him his views and reflections.

It is easy to perceive that the impressions derived from a man of this stamp, must have influenced the character of the youthful Jussieu, as much as they did his pursuits. Hence arose a similar simplicity of habits, constancy at work, and perseverance in following out any great and leading idea; never were two men apparently so made to merge into one, and to prolong the same existence, as if they formed in fact only two ages or successive phases of one and the self-same life. After five years spent with his uncle in active study and intimate converse, the young Laurent, though but twenty-two years old, was already a *Doctor of Medicine*, and Le Monnier's Assistant in the botanical chair at the *Jardin des Plantes*. To Bernard he constantly referred, consulted him in every difficulty, applied to him under all his doubts, often as much stimulated by filial affection as by scientific curiosity. For after the death of Antoine, his brother Bernard had sunk into deep dejection, and at length lost his eye-sight. Nothing, perhaps, would have sufficed to render life tolerable to the old man, but the ingenious schemes by which the youth continually managed to rouse his mind, in suggesting subjects of inquiry alike striking and difficult.

In 1773, a place became vacant at the Academy, and Bernard persuaded his nephew to offer himself to fill it; but the latter had as yet published nothing. A memoir must therefore be prepared, and for the subject of his first labours, Laurent chose the *Examination of the Family of Ranunculaceæ*. The subject mattered little, for whatever this might be, it afforded an opportunity that made him feel his strength, and display his striking ideas, and he accordingly followed out and remodelled his uncle's views, impressing them with the

stamp of his own mind and genius. Often did he repeat that this Memoir it was which made him a botanist, that the veil was withdrawn, to use his own words, and the great principles which he should constantly labour to enforce and demonstrate, were now first displayed to his eyes. This Memoir struck all those who heard or read it as belonging to a new order of ideas, and the new element and principle of the *Natural Method* was thenceforth to assume its place in the science, and to alter its aspect. Up to this period, much of Science had consisted in *nomenclature;* Linnæus leaned to this opinion; now, by a process which seemed to bring it nearer to its true object, which is the nature of *things*, the study of characters should supersede the study of names. "Nomenclature," says our author, "is not to be neglected; but research into characters is a more important part of Botany." Nor are all characters to be held of equal value; they may be general or particular, constant or variable, primitive or secondary. Often is a single one equivalent to many, so that we should not content ourselves with *counting* the characteristic marks, but endeavour to *appreciate their respective importance.* Characters are also indications of the affinities of things; for in every created object, whether organized, vegetable, or animal, each individual part has its necessary relations to all the others. Thus some judgment may be formed of all by any one, and those parts by which we form a judgment of others, are what we call *characters.*

Now, naturalists began by hunting for these characters or signs in all the respective parts, almost indifferently. Soon, however, they found that there is not an equal importance to be attached to all, whether as points of union or separation, and hence arose the *calculation of characters*, which calculation gives a solution to the problem of the *Method.*

Gessner, in the middle of the 16th century, first originated the idea of drawing the primary characters of plants from their *organs of fructification;* this was the first step, followed by Cæsalpinus, who demonstrated the pre-eminence in this

respect of the *seed*. The most interesting question, perhaps, in the whole range of vegetable physiology, is to determine the peculiar function of each portion of the flower.

A flower, as every body knows, consists of many parts. In the centre is the *Pistil* or female organ; round it are placed the *Stamens* or male organs; the *Corolla* or brilliant portion, which constitutes the coloured part of the flower, (the flower itself, according to Tournefort,) surrounds the stamens; while the *calyx*, a prolongation of the outer layer of bark or epidermis, encloses the whole.

More than a century and a half after Gessner, Tournefort was still in ignorance of the use of stamens, and even denied it, when Vaillant demonstrated the fact. The theory of the latter writer on the sexes of plants, was brought into notice by the ingenious system of Linnæus, subsequently confirmed by Linnæus', Gleditsch's, and Koelreuter's searching experiments, and thus was the physiological difficulty explained.

The problem relative to the *method*, was never solved till Jussieu did so. He perceived that the corolla and calyx were deficient in a great number of plants, while the pistil and stamens, (those reproductive parts of the embryo or new plant,) always exist; taken separately, each of these organs only conveys incomplete characters, while the complete and natural characters are afforded by these two organs taken together, and considered as to their respective insertion. Thus the *Insertion of the Stamens* forms the primary character in the flower.

The primary distinctive character of the seed is derived from *the lobes of the embryo*, or rudiment of the future plant, of which they are the first leaves, the organ which furnishes it with its first aliment. We must therefore be easily convinced how much the *simple and remarkable differences* that are perceptible in these primary organs must influence the general development of the plant and its entire organization. All the other parts of the seed, which are extraneous to the future plant, and constitute, properly speaking, the

seed itself, as the seed-coats, the perisperm, &c., are but of secondary moment.

The Memoir in which M. de Jussieu thus laid the first bases of the science of characters, was, as above stated, published in 1773, and procured him admittance into the Academy. The following year, 1774, he published another on a more extensive and complete scale, in which all these striking views are again taken up, handled anew, and placed in a clearer and more precise light; and the following circumstance gave occasion for this publication. The method of Tournefort, established by himself in the *Jardin des Plantes*, was still persisted in there, notwithstanding all the changes that had taken place in science. The need of a reform was felt, especially as the number of acquired species was much increased during this protracted interval, and the old locality had become insufficient for their accommodation. Buffon first projected an augmentation worthy of the times to which his name has added lustre, and having laid his plan before Louis XV., who was fond of Botany, the king approved and adopted it. The Garden was at once doubled in size, and that portion devoted to the *school*, properly so called, was to be immediately replanted.

Nothing remained but to decide on the plan that should be pursued when planting the ground. It was impossible to preserve the system of Tournefort, at least as a whole, especially because of the two great improvements which Linnæus had introduced; namely, defining the genera, and simplifying the nomenclature. Nor, on the other hand, was it practicable to adopt the Linnæan method, ingenious as it is, because of its being in reality still farther off from the order of nature, than that of Tournefort. The choice remained, whether to correct one of these great systems by the other, or to establish a new one; and the latter alternative was selected. The new system proposed by M. de Jussieu, is a scientific combination of the celebrated labours of Linnæus, Bernard de Jussieu, and Tournefort. From Linnæus it

derives the genera, species, and nomenclature; from Bernard, the orders and natural families; and finally, it owes to Tournefort the mode of multiplying the classes of Bernard, without breaking his orders and families.

The Genera of Linnæus were the most concise then extant; his Species the best defined; and his Nomenclature was admirable. This nomenclature, which gave only two words to every plant, the name of the species and genus, thus doing away with the long phrases of Tournefort and Gaspard Bauhin, constituted in itself, indeed, an eminent reform in the science of Botany. Still, when it was proposed that this nomenclature should be adopted at the *Jardin des Plantes*, a difficulty arose, owing to the prejudice cherished by Buffon against the technical department of classification. He utterly discarded all Linnæan names. But M. de Jussieu having pointed out to him that these names formed one of the happiest changes that Natural History had ever undergone, adding, that the *Jardin des Plantes* ought not to be behind in any improvement, Buffon yielded the point, and the nomenclature of Linnæus, with the Natural Orders of Bernard, were immediately introduced in the new establishment.

These *Natural Orders*, as Bernard had imagined them, were comprised in *seven classes*, which Laurent judiciously increased to fourteen. The *Lobes of the Embryo* constituted the three first classes; hence arises the famous division of the whole vegetable kingdom into *Acotyledones*, *Monocotyledones*, and *Dicotyledones*.

The *Insertion of the Stamens* on the pistil, on the part which bears the pistil, on the calyx, or on the corolla, affords the subsequent divisions.

Thus, there are two descriptions of characters; the first derived from the embryo, the second from the relative insertion of different parts of the flowers; and these furnish all the classes. Characters of less and less importance supply the other groups, families, genera, and species; the groups always holding the same respective rank in the general system as

their characters do in nature; and thus the leading principle of the *method*, drawn from Nature herself, is the relative value of characters.

Again, how shall this *relative importance of the characters*, that basis of the whole edifice of system,—how may it be appreciated in its turn, with perfect certainty? Here two equally sure criteria occurred to our naturalist; one, founded upon reason, decides the value of any character by the importance of the part to which it belongs. In a plant, everything tends to the formation of the flower; and everything in the flower, to the formation of the embryo or future plant. Thus the formation of the embryo is the great object and end of all other vegetable functions, and "*there*, consequently, *in the embryo*," says M. de Jussieu, "must naturalists look for primary characters." When this plan, derived from reason—this *rational plan*, as it may be termed, fails, (and it soon does so in Botany,) our author supplies its place with one that is purely experimental, equally certain, and which is never-failing. In default of the function which is unknown, or imperfectly known, and therefore insufficient to decide on the importance of an organ, he determines that importance by the *constancy* of the organ. Nor is this all. It is with every circumstance of an organ as with the organ itself; the most constant and most general circumstance is invariably the most important. Linnæus has based his system on the stamens; their number, attachment, union, and proportion; the situation of these parts; he views all this, and employs it all, and yet he does not perceive that amid all these characters one alone is really valuable, because it alone is unvarying—namely, the *attachment of the stamens*, or their *insertion*.

Tournefort founded his system on the *corolla*. The absence, presence, situation, division, and form of the corolla, all afford him characters, variable though they be; while he overlooks the importance belonging to the attachment of this organ, which alone is constant.

Both these great men failed of discovering the *Natural Order*;

and for the same reason, because they alike neglected to observe the relative importance of different characters. More yet may be said, which is, that taking all botanists from the time of Gessner downwards, those who were most correct in their views, and who seemed, as it were, to stumble on some fragments of a *Natural Arrangement*, these were all following, unknown to themselves, the views afforded by the ***relative value of characters***. Still farther, there are natural families all ready made; as the *Grasses*, the *Compositæ* and *Umbelliferæ:*—let any one study these families, and he will find that every character by which any individual plant varies, is only subordinate and secondary; the primitive, important and essential character pervades the whole family.

Order, gradation and subordination exist therefore in characters, and the main difficulty is to classify these characters. Now this was quite a novel aspect in science. Bernard de Jussieu, who had introduced the principle of the relative value of characters when classifying plants, had not sufficiently combined the theory and practice of this principle, but Laurent did so; he showed its aim, he consummated the great change which his uncle had commenced, and exhibited the philosophy of this system.

At the time when M. de Jussieu was writing these two Memoirs, which contain the germs of all that he finally accomplished, his uncle and Linnæus were both alive. These great Naturalists died soon after, Bernard in 1777, and Linnæus the following year. From thenceforth the first place in Botany was vacant, and every one perceived that it was M. de Jussieu who should fill it; he himself must have been sensible of it too, and I accordingly find, in one of his letters, the following remarkable words, "There are circumstances of which a man ought to avail himself, and I should be to blame if I neglected one which is now offered me. In three months, we have lost the three greatest botanists in Europe, M. de Haller in Switzerland, M. Linnæus in Sweden, and my uncle at Paris. How honourable it would be to succeed them, and thus secure to France the precedence which

foreigners have hitherto disputed with her!" These words reveal a consciousness of his own abilities, which was still more proved by the task that he then proposed to his own mind; that of subjecting the whole vegetable kingdom to the principles set forth in his two Memoirs;—an immense enterprise, whose result was his grand work *On the Families of Plants*, and from which may be dated the new spirit which now animates all those who occupy themselves with the affinities and classifications of Vegetables.

The *Natural Method* is the object towards which all the efforts of Naturalists were tending, even before they found it; and when once found, which became the guide of all their subsequent efforts. The ancients, if we except Aristotle (and him alone), paid no attention to the affinities of created objects; in Natural History, and especially in Botany, they looked only to *the use ul*, and studied Vegetables solely as connected with domestic economy and medicine. The order, the affinities of species, and their arrangement,—all this purely scientific department of Botany escaped them altogether; nor could it be otherwise, they knew too few plants. Theophrastus reckons but 500, Dioscoides 600, and Pliny 800 plants. The *Natural Order* and arrangement of created beings has its materials scattered over the whole surface of our globe; and may be aptly compared to the task of collecting and rebuilding an edifice, many of whose component parts are wanting. Of course, the greater the proportion of missing portions, the harder would be the task of putting the structure together; if too many were absent, the work would be impracticable, and to be perfectly certain that the edifice, when finished, was exactly correct, every individual fragment must be there.

Wonderful are the discoveries made since the Middle Ages;—that of a new world, the most wonderful of all! The curiosity of men, once roused by great events, leads them on to more energetic and daring researches. Sciences are brought anew into notice, great expeditions are undertaken, and the known number of organized bodies increases with an aug-

menting rapidity, still accelerated as it approaches our own times.

To confine ourselves to Botany; the number of plants which is estimated, by the early authors of the 16th century, to be from eight to nine hundred, had been before the close of that century, raised to two thousand;—yet a hundred years farther on,—we find Tournefort reckoning them at ten thousand, including varieties; when reduced to the total of species, properly so called, Linnæus makes the amount 7000; —20,000 according to Jussieu; and at the present day, even this large number is quadrupled! Nearly 80,000 plants will be described in M. de Candolle's great work, now in progress; the *Compositæ* only, are upwards of 8000; a single family thus containing more individual species, than the whole vegetable kingdom was estimated to comprise in the times of Linnæus!

The peculiarity which perhaps places the powers of M. de Jussieu's mind in the strongest light, is the way in which he made use of the materials that were then known to exist. As I have just said, these materials have since been quadrupled, and yet there is no great principle of the *Natural Order* which does not find a place in his book, and hardly a single combination among those established by his successors, of which the germ may not there be seen. Fontenelle admires in Tournefort, a classification in which upwards of 1200 new species, "which," he adds, "*were unexpected*," could be placed without disturbing its foundation. What would he have said of the *Arrangement* by M. de Jussieu, when nearly 50,000 species, unknown at the period when this author was writing, might find their own stations, and almost always a station indicated beforehand, *a station which was expecting them?* The work in which M. de Jussieu sets forth this *Method*, the fruit of deeply calculated combinations, is the result of fifteen years' unceasing labour. He sent it to the press in 1788; his mind so imbued with it that its printing began before the manuscript was complete, the author indeed never being more than two or three leaves in advance of the

printer! A still more remarkable trait is, that the earlier sheets having been printed without those *Notes* which are appended to the characters of the Families, and which perhaps constitute the most highly finished, and the deepest portions of the whole work, M. de Jussieu caused these leaves to be mercilessly cancelled, nor flinched in the least degree from what might have seemed like an extreme measure in a more ordinary work: for he felt that the book he was writing would be eternal.

The printing, and consequently the composition, for they proceeded simultaneously, lasted fifteen months, and the work appeared in July, 1789. It opens by that celebrated *Introduction*, in which the author displays anew, (and this time, in all their true order), those great principles which he had announced in his two Memoirs of 1773, and 1774. Here these principles are seen to compose a complete body of science. Fifteen years' close study might well confer lucidity, combination, and strength; and here, by his reflections, his experience and profound meditation, the author rises to the highest rules of the art of method, and combines with this art a new science, a science created by himself, that of characters.

Two facts preside in every view of the *Natural Method;* the first is the *subordination of the characters* among themselves. Availing himself by turns, of reason and experience, M. de Jussieu concluded, as we have seen, that organs were *important according to their functions*, and when this function was unknown, he decided on their value from their *constancy;* the latter being an ingenious contrivance, whereby a fact, that it is sometimes impossible, and almost always difficult to ascertain, namely, the *function* of an organ, is skilfully superseded by this other test, than which nothing can be easier, simpler, and more evident, namely, its *constancy*.

The *second* constituent principle in the Natural Method is the *subjection of the characters to the groups*. In the *Artificial Method,* we begin by selecting one character from amongst all the others, and then reducing the species to this character;

—in the *Natural Method* this order is reversed, and the character is made secondary to the species.

The Systematic authors descend from Classes to Genera, and from Genera to Species, and thus proceed from general to particular. M. de Jussieu completely overturns this proceeding; he "rises," according to his own statement, "from particulars to generals." And here lies all the difference between the *Artificial* and *Natural Methods;* the former subjugating species to genera, and genera to classes, while on the contrary, the latter make classes depend on genera, and genera on species; the first renders the facts subservient to ideas, and the second, ideas to the facts.

In this new path, opened to the science of affinities, M. de Jussieu claims at every step, the attention of the Naturalist. But the secret of his powers lies in the path that he followed. The example of Natural Families, all ready-made, guides our author to the formation of those which are less obvious. In those families which are so natural in the eyes of all botanists, the *Grasses*, the *Compositæ*, *Leguminosæ*, *Umbelliferæ*, &c., he descries a leading beam of light, in their general similarity of structure; every character, which if it were applied to one of these families should disturb its species, must therefore be excluded; thus, the first condition on which a character must rest, is that it shall not interfere with the combination of such species as are founded on the *tout ensemble* of their structure. And this calculation of the relative importance of characters, deduced from their affinities with the general structure, is the principle on which M. de Jussieu rests his whole system. The peculiar object of his book is the distribution of genera into families. Tournefort had already collected species into genera; Linnæus had given a high degree of regularity and precision to these genera. What was wanting therefore, was to perform for the groups of a higher order, for those very groups which Tournefort and Linnæus had omitted, what these Naturalists had done for genera. M. de Jussieu distributes all the genera that were known at the time when he wrote, in number nearly

2000, into *a hundred families*. He founds each of these primitive families on a fixed similarity of characters, and shows that this concurrence of characters is indispensable; for each character, taken separately, may appertain to several families; it is their assemblage, and an assemblage differing in each, and which is peculiar to that family alone, which constitutes its distinctive traits.

The character of each family is thus not unique nor arbitrary, as in artificial systems; it is *one*, but *manifold*, and consists in the assemblage of characters pointed out by observation and fact, as being the most unvarying in each family.

It is easy to perceive that such a new light could not possibly be cast on all these families, these principal groups of the vegetable kingdom, unless the author scanned the whole of its elements,—the species and genera, and the characters of every genus. Throughout this formidable undertaking, his attention never slackened, the experienced eye of the Naturalist everywhere admires such consummate investigation, happy tact, and profound sagacity, as till then had never perhaps been equalled, in any branch of science. Long ago, as I had remarked, certain families of plants were recognised, by all botanists, as being *natural*. In 1672, Morison pointed out the leading features of that of the *Umbelliferæ*. Some years later, Ray attempted a distribution of the whole vegetable kingdom on a vaster scale; he brought forward into notice the grand divisions of all plants into *Dicotyledones* and *Monocotyledones*, and already ranked the *Palms* among the latter. Finally, in 1689, precisely a century before M. de Jussieu, Magnol published his work on the *Families of Plants*. But neither Magnol, Morison, nor Ray were able to follow these general views into detail; and their scattered ideas and happy traits were only lost. Towards the middle of the 18th century, that very Linnæus to whom Botany already owed its nomenclature, its descriptive language, and the most concise artificial system it had ever received, published a suite of *Orders*, or *Natural Families*, which he first raised to the number of sixty-four, and reduced at a subsequent period

to fifty-eight; and yet, his two Essays contain nothing but a series of names; no explanation, development or indication of the motives which can have guided the author, whether in the formation or classification of these families. "This was," in the words of Jussieu, "a sort of problem, which Linnæus left to his successors to solve,"—and which has never been solved. A work by Adanson, published in 1763, is far more complete, and when viewed as regarding natural families, of much greater importance than that by Linnæus. The most striking feature in Adanson is his turn for reform, a peculiarity which may be seen in his very earliest production, the *Natural History of Senegal*, where, in the classification of the *Shells*, he completely changes the generally adopted mode of arrangement, placing it on its only true basis, namely, the *structure of the animals*, of which the shells are, in fact, solely the coverings. Equally does this original and renovating genius appear in the same author's book, on the *Families of Plants*. No man has striven harder than Adanson to liberate science from the trammels of system, and to bring to light the radical defect that attaches to all *Artificial*, that is, *partial systems*, deriving their character, as they do, from a single part or organ, and that part selected arbitrarily;—no one ever perceived more distinctly, that *Method*, if it would coincide with *Nature*, must rest on the universality of the parts; but what Adanson did not see is, that some parts are subordinate to others. And as a proof of how far prejudice may go, even in a mind of this description, is the following curious phrase, which I find in Adanson's *Report to the Academy on M. de Jussieu's First Memoir*, where he says, "the principles adopted by M. de Jussieu, will perhaps find a somewhat difficult reception among those botanists who think with me, that a method, to be natural, must be founded on *all* the parts viewed as a whole, without bestowing an exclusive preference on any one above all the rest." Here the mistake of Adanson is evident to every reader; what he rejects under the appellation of "*exclusive preference*," is exactly the subordination of

different characters; and thus again, he objects to grouping, (at least grouping according to the most striking features in each group); families alone does he admit, and calculates their number at fifty-eight; classes he refuses; and yet does not seem to be aware, that in thus collecting groups together into a kingdom (as he styles it), and rising from lower to higher, beginning at the species, with a graduated ascent, from species to genera, from genera to families, and from families to the kingdom, he adopts in fact, that very method, that gradation, which he condemns.

The individual by whose labours M. de Jussieu profited most, was his uncle Bernard. Still, the *Catalogue* of the latter author is, like the *Orders* of Linnæus, nothing but a series of names. The principles, however, which guided Bernard, whether in forming families or in dividing families into classes, are faithfully preserved by his nephew, and are exactly what I have already detailed,—namely, the *subordination of characters among themselves*, and the subjection of *characters again to groups*.

To Bernard therefore belongs the honour of having laid the first stone of the edifice of the *Natural Arrangement*, he it was who descried the principles on which this arrangement is founded. But, while on the one hand, he applied these principles without clearly defining them; so on the other, in the matter of application, he gives only a string of names. In Bernard, we see nothing of that Philosophy of the Method, which discerned a new horizon to the natural sciences; nor of that discriminating selection (choix raisonné) of the characters, which, variously grouped, mark out the families; and these are the two real honours, the foundation of M. de Jussieu's enduring fame.

Far be it from our intention to seek to raise one of these celebrated men at the expense of the other! Bernard is the inventor; he took the first step; and if his nephew went far beyond him, it is because he started from the point to which his uncle had guided him. Truth is my only object, and while seeking for it in the study of their minds, I think I can

perceive that the peculiar turn of each may be distinctly seen. Bernard, by the strength of his penetrating powers, descried the principles of Natural Order, but he derived little advantage from the sight, and others derived still less through him; Laurent saw them too, while availing himself and aiding others also to make use of them; thus the principles, if I may so speak, spring up in the one Jussieu, and ripen in the other; one perceives, the other explains; to the former belongs the early period when genius makes its discoveries, to the latter the period when genius reasons on what it has discovered; for, most entirely analogous to the difference that exists between these two ages, is the disparity between the labours, the style and turn of mind of the two MM. de Jussieu.

If, after having thus compared the work of M. L. de Jussieu, with what had appeared before it, we equally try it by what has come since, its merit will prove quite as striking and unique.

It has been stated above that this author established one hundred primitive families. Not one of these families has been subsequently suppressed, and more than fifty have undergone no modification. Three of the others have been united (and united entire) to neighbouring groups, which is only a different mode of association. Most of those which remain, from the unavoidable effect of the immense number of species that nearly half a century has added to our herbaria and gardens, have necessarily required division and subdivision, but almost all these sections have proceeded on grounds already indicated by M. de Jussieu himself. Finally there are five, and five only, which were found to be natural but in part. The errors therefore solely affect some scattered genera and fragments of families; and even there, a note, a hint, a doubt, almost invariably comes in to put us in the way of attaining the truth; a truth which nothing short of the most astonishing sagacity could then have detected, when the materials which the author possessed from whence to deduce it were so scanty, and while so many new ones have

since been found requisite to enable subsequent writers to work out the points which he left doubtful, in an entirely complete and satisfactory manner; and now, if I were asked where lies the peculiar merit, the merit that marks every page as it were of this work, and whereby it is so strikingly distinguished from all that had previously appeared in this wide and well trodden field? my ready reply would be that this merit resides chiefly in the unvarying precision of detail which assigns to every fact its right place; and which, not confined to the main leading results, that are rapidly marked in each genus, neglects none of the circumstances in all the orders on which those results are founded; a merit of essential importance in a study where *all* the facts are necessary, where hardly any one of them can be supplied by another, and where nearly all are of equally difficult acquisition, a merit perhaps the rarest of all, and illustrative of that deep axiom of Buffon's, that "*patience*," that is, constancy in great efforts, "*is genius*."

M. de Jussieu has been blamed, and justly, for founding some of his classes on the *form of the corolla*, and it is certainly the weak point in his method, which he himself plainly confesses. "These classes have," he says, "the defect of being unable to subsist, without admitting some exceptions;" and he adds, that if only strictness and not convenience be consulted, we ought to adhere to the sole invariable characters, the *lobes of the embryo*, and the *insertion of the stamens*. Still, in proportion as the number of species has augmented, it has become evident that even this last character, that derived from the *insertion of the stamens*, does sometimes vary, and should consequently be excluded from classical characters. Every thing on the contrary has confirmed the grand division founded on the *lobes of the embryo*. M. Desfontaines, by one of the most interesting of discoveries in vegetable anatomy, has demonstrated that the distinctions drawn from the organs of vegetation answer in every instance, as regards this division, to corresponding peculiarities in the organs of fructification. We

may even say that this striking confirmation, drawn from the structure of the stems, does place the three grand groups of the vegetable kingdom in a rank that M. de Jussieu's name of *Classes*, bestowed on them in common with other following groups, is far from indicating with sufficient emphasis. They may be compared with the four *Branches of the Animal Kingdom* established by M. Cuvier, and under which are arranged at a due distance, the classes, properly so termed; and it might be as well that in both the animal and vegetable kingdom, a suitable and determinate appellation were bestowed on these great and leading divisions.

How then may the interval which separates these three first groups of the vegetable kingdom from the *mere families* be filled up, without admitting, between these groups and these families, somewhat of the artificial and arbitrary? Here, again, M. de Jussieu has the merit of having indicated that way, by the association (more than once hinted in his work), which several families have one among another; and this again, has been admirably pointed out by Mr Robert Brown. "The real and present difficulty," he says, "is to combine families into larger and equally natural groups." And it is in fact, this very difficulty, that Mr Brown has himself admirably mastered in a certain number of cases, which, if alike effected throughout, would give us a perfect general classification.

When M. de Jussieu first published his work, he was undeniably the first Naturalist of his day, and yet it must be owned that his labours did not then meet with the just appreciation that posterity has bestowed upon them. The period was 1789, and France was then in the midst of that mighty revolution which opened to her all the gates of her new destinies, so that it was little likely that much attention could be spared for the revolution which was going on in Botany. Besides, this work went too far beyond all received opinions, to be comprehended without long study. Slowly, therefore, did M. de Jussieu's ideas find a reception among Naturalists and particularly among foreign Naturalists.

In France, so soon as the restoration of social order permitted a resumption of peaceful studies, a peculiar occurrence took place which gave unexpected force and influence to those principles. A young Naturalist, till then living in obscurity in a country town, and for the honour of having first noticed whom, many of our contemporaries have disputed, (and an honour it doubtless is, and of which M. de Jussieu may claim a portion), published in 1795, two Memoirs, one "*On the Principles of Classification among the Mammiferæ*," and the other "*On the Linnæan Class Vermes*," and these two Memoirs were in Zoology, what those of M. de Jussieu had been to Botany; they changed the aspect of that science, and thenceforth in Zoology as in Botany, the words *Natural Method* had their complete meaning; the *Natural Method* being the *method founded on organization*.

M. Cuvier, long afterwards, paid, on a solemn occasion, his homage to M. de Jussieu, and authoritatively declared, in his *Historical Report on the Progress that the Natural Sciences have made since* 1789, that "the work of M. de Jussieu constitutes in the sciences of observation, an equally important epoch with the *Chemistry* of M. Lavoisier in the experimental sciences." Perhaps, however, the following tribute that M. Cuvier pays him in the former of the above mentioned Memoirs, is yet more remarkable. "Zoologists," says Cuvier, "had no idea whatever of the calculation of characters which botanists had seen really to exist, and which one of them has so admirably demonstrated in a work, whose happy influence will ere long be felt by all the other branches of Natural History, though its immediate bearing is addressed but to one."

Zoology, however, offered a far wider field than Botany for the application of a Natural Method, founded on reason. In animals, the organs are distincter, their functions more decided, and consequently, the characters more evident. The modifications of the external organs depend there visibly on modifications of the internal ones; the brain, heart, and lungs, for instance, cannot change without the necessarily

corresponding parts changing also; and the reason of this strict agreement between all the modifications of the animal economy is evident, for the principle of the *subordination of the organs*, becomes in animal life, the very principle of the condition of existence itself.

Thus, by its application to Zoology, the science of characters took a new flight. The Method has become complete, by generalizing itself and extending from the one organized kingdom to the other; and even our two authors, who, when compared, exhibit distinct traits, may yet be said to complete each other. M. de Jussieu is the fitter man to follow out the continuous chain of details with persevering patience and indefatigable sagacity, M. Cuvier the better adapted to reach the final consequences with rapid flight; the former is constituted to shrink from no difficulties in the pursuit of experiment (and this is the only means now applicable to Botany), the other to survey at a glance that reasoning process which best befits the science of Zoology; both having given a new impulse to the human mind, the impulse of Method, which, (consisting in the union of objects by the qualities they possess in common to one another), is, in fact, to the sciences of observation, what analysis, or the art of reducing them to their distinct elements, is to the experimental sciences.

And in the same way that *analysis*, which took its origin in the experiments of Galileo, has gradually passed from the physical sciences to that of the *mind*, (becoming the *Philosophical Analysis* of Condillac), so does *Method*, the offspring of the researches of modern Naturalists, await to produce all its effects, the abstract study of the philosopher. And then, and not till then, *General Philosophy*, which springs no less from the much neglected science of *classifying ideas*, than the deeply studied art of *unravelling them*, shall become complete.

M. de Jussieu had published his work, as above stated, in 1789. The much confinement to his cabinet which such a production entailed, permitted him to remain in a happy comparative ignorance of the political movements which were

disturbing the whole nation; but hardly was his book completed, when he found himself charged with one of the departments of the mayoralty of Paris. This office, as is well known, was then divided into several departments, and the charge of the *Parisian Hospitals* fell upon M. de Jussieu, on which occasion he published his *Report* on those institutions, a description of labour well adapted to bring the sciences into high respect, and in which our author had been preceded by only one member of the Academy, a man whose name will ever be venerated among his fellow creatures, the illustrious and unfortunate Bailly.

In 1793, the *Jardin des Plantes* was new organized, and received the name of the *Muséum d'Histoire Naturelle.* Daubenton was its first Director, and M. de Jussieu succeeded him. In these stormy days, M. de Jussieu devoted himself wholly to the charge of this noble establishment, with which stand so closely connected the honour of his name and almost all his family recollections. From the very commencement of the *Institute*, he naturally made a part of it, and was one of the first Presidents of the new *Academy of Sciences;* holding the Vice-Presidentship on the very year which was distinguished by Napoleon being President. In 1804, the *Chair of Materia Medica* in the Faculty of Medicine, having become vacant by the decease of Peyrilhe, he offered himself to fill it, and all the other candidates withdrew. When he became Professor, he took as the basis of his lessons, the fruitful principle of the agreement of the properties of plants with their botanical affinities,—a principle which his earliest labours had pointed out; a novel application of the Natural Method, and the most appropriate of all measures, perhaps, for extending the influence of *Materia Medica.* M. de Jussieu was nominated to the council of the University in 1808. During the latter half of his life, his attention was chiefly occupied in the task of preparing a second edition of his great work. Unfortunately, his strength diminished as the scientific materials increased, so that he left only fragments of this noble performance; these portions, however, are so

admirable, that they alone would have sufficed to found the reputation of any other man. These fragments form a series of Memoirs, inserted between the years 1804 to 1820, and with little interruption, in the *Annales du Muséum.* More than one half of the hundred primitive families of our author are there revised, each being examined in detail, and every one of the genera composing it. In 1789, M. de Jussieu had not had it in his power to avail himself of Gærtner's great work on *Fruits*, but he afterwards takes it as a basis for comparisons,—the touchstone which should try all the new affinities that he attempts. When studying the structure of the seed, Gærtner had directed his anatomical investigation to that very organ on which M. de Jussieu founds his Method, and when applied to the science of affinities, the observations of Gærtner assume a new and unexpected importance, of which M. de Jussieu makes use to cast a fresh light on the calculation of characters, the formation of families, and the art (till then so little known in Botany), of applying to each other these two considerations, that of Anatomy and Method, on which, for all time to come, the whole progress of science must depend.

M. de Jussieu's relaxation from these trying labours consisted in writings of another kind, but of which Natural History, and of course the *Jardin des Plantes*, formed the subject—I mean the *Mémoires du Muséum.*

The *Royal Garden*, founded during the reign of Louis XIII., by an edict of 1626, was at first merely a garden for medicinal plants; that was its correct name; and its cabinet contained solely an assortment of drugs. M. de Jussieu details the trifling beginnings of this collection, destined since to become the most magnificent natural establishment extant; he records the difficulties of all kinds that were to be surmounted, and the petty war waged against it by the *Faculty of Medicine*, which peculiarly opposed the instruction in Chemistry, (the object of one of the new chairs in the Museum), "because," the Faculty alleged, "Chemistry ought not to be propagated in Paris, seeing that it had been for

good and sufficient causes, censured and prohibited by a parliamentary decree." Our author proceeds to mention the illustrious individuals to whom this noble establishment has owed its brightest lustre, Tournefort, Duvernay, Bernard de Jussieu, Vicq d'Azyr, and Buffon, pausing at the date of the latter writer, so that one cannot but regret that he did not pursue the theme through a later and no less splendid epoch. For in this more recent epoch it has been, that Haüy, unveiling the mechanism of the formation of crystals, has subjected the very phenomena of nature to the laws of calculation; while Jussieu was bringing to the test of other laws, those of reasoning founded on experiment, the new forms of vegetation that were poured in with unexampled profusion from almost every part of the world; and Cuvier, piercing through the layers of our globe itself, detected there unknown generations, and invented the art by which these ruins and fragments of bygone creations were re-assembled, so that the laws of comparative anatomy endowed them with fresh life, and as it were with a new existence; and thus to all these inhabitants of ancient worlds reanimated by him, his powerful voice has seemed to issue the fiat, to rise up and walk!

I would not willingly omit to notice any of the productions of M. de Jussieu's pen. His *Thesis*, published in 1770, gives the first clear ideas on those multiplied analogies of Vegetables and Animals, which seem to unite the two organic kingdoms; views, then quite new, for Pallas only had slightly hinted at them, and containing the same profound and lucid ideas as have since been so strikingly developed by Vicq d'Azyr and Cuvier. One single writing of M. de Jussieu's alone, may pass by with little notice, and might perhaps be as well entirely omitted, for it is quite foreign to Natural History, his *Report on Animal Magnetism*, published in 1784. There is nothing in this production, which belongs to the deep and incontestable subjects, which formed the habitual theme of our great Naturalist's thoughts; and, consequently, it can cost us little to confess here that it is by no means

marked by the judicious and firm mind of the legislator of Botany.

The Restoration had found M. de Jussieu in the Council of the University and at the School of Medicine. In 1815, the Council of the University was superseded by that of Public Instruction, and to this new council M. de Jussieu was not summoned. In 1822, he was excluded from the School of Medicine, in company with Vauquelin, Chaussier, Pinel, Deyeux, Des Genettes, &c.; and in 1830, when this injustice might have been repaired, Vauquelin, Chaussier, and Pinel were dead, and M. de Jussieu himself having attained to eighty-two years of age, was too old to resume his place at the Faculty. In 1826, he resigned in favour of his son, M. Adrien de Jussieu, his chair at the Museum; and some years after, in 1831, he had the happiness to see his son enter the Academy.

Throughout his whole life, full occupation had been one of his absolute necessaries, and when regular business allowed him a little leisure, he devoted it to reading, arranging and examining the plants in his cabinet. He had even a custom of reading as he walked along the streets. By a peculiarity of conformation in his eyes, which belonged to the whole family, his sight had been always very short, and when he was only in middle life, he wholly lost the use of one eye, and towards the close of his long career, the other became likewise so weak that he was unable either to write or make observations. From this time, being debarred from working himself, he sought to derive benefit from the labours of others; and all the tender care that he had exhibited towards his blind uncle Bernard, a still dearer individual then paid to him. His friends proposed questions to him, that might give employment to a mind, peculiarly adapted like that of Bernard, for meditation and combination. He was duly informed of all the new discoveries, and if aught among them bore any connexion with his own ideas about *Characters* and the *Method*, his botanical instinct, ever on the alert, was sure to seize upon it; every thing was quickly defined in the

simplest manner; M. de Jussieu afterwards remodelled these new opinions in Latin of peculiar elegance, and, preparing a second edition of the *Introduction* to his great work, gave himself no rest till he could introduce them into it. This last performance of M. de Jussieu's, the work of an aged man, almost ninety years old, has just been published in the *Annales*: and wonderful is it to see to what an advanced period of life the author has preserved all the clearness of his intellects; and still more, how powerfully those ideas which had possessed themselves of his mind first in 1773, and had been brought forward again in 1774, and 1789, remained unchanged throughout his protracted existence, and held their undisputed sway to the very last.

He was heard one day, explaining to his secretary with the utmost frankness, why he wrote in Latin preferably to French. In the first place, he said, it fills up my time, and that is always an advantage, now; and then, common ideas, clad in a foreign garb, assume a less homely aspect: if I were to express them in my own tongue, I should fear they were not worth the trouble of saying at all, and should make no more account of them.

M. de Jussieu certainly felt pleasure in his own celebrity, but never did he fail to attribute the greater part of this celebrity to his uncle, and this conviction was expressed by him only a few years ago, in a very pleasing manner. Some person complimenting his son in his presence, on the advantage of bearing so illustrious a name, "yes, indeed," answered M. de Jussieu, "the name has been of very great use to me."

To the very last years of his life, he never failed, when in Paris, to attend at the Academy, and he continued to do so when he could hardly either hear or see, feeling happy in the knowledge that he was among his brethren. For sixty-three years he was a member of the Academy, and for sixty-six the Professor at the *Jardin des Plantes*, either as substitute, or fully invested with the office.

In the country, where, towards the close of his existence, he passed a part of each year, walking was his only amuse-

ment; he still continued to gather plants, and though unable to see distinctly, he would bring them closer and closer to his eyes, till he satisfied himself what they were. When sight finally failed him, he made them out by feeling, and was quite delighted when he found that he had succeeded, for his mind had always been addicted to solving questions and grappling with difficulties. That this was his disposition, may be seen by these words which I borrow from one of his first compositions, and words which may be the more aptly quoted at the close of this *Eloge*, as their author, in striving to define the merits of a great botanist, appears unconsciously to have portrayed himself. " A man of talent," says M. de Jussieu, " may make *systems*, and vary them infinitely; but the *Natural Order* can only be the work of a consummate botanist, whose patience in examining the minutest details, is as conspicuous as his acuteness in drawing their consequences and forming inferences from them; thus may botany, instead of consisting only of a science of memory and nomenclature, become a new science, possessing its affinities and combinations like chemistry, and its problems like geometry."

The character of M. de Jussieu developed itself early, and continued always the same. The strict habits of Bernard had given that character a precocious maturity, and while still very young, M. de Jussieu was invariably treated by all who surrounded him, frequently they were persons much older than himself, with respect, heightened by esteem. His piety, like that of his uncle, was most sincere. Though gifted with such superior genius, though enjoying such high celebrity, he contrived to pass on the calm tenor of his way, and preserved a most philosophical tranquillity of mind. Attacked, as he was, in almost all languages, he never replied; he said that if he were mistaken, he deserved to be attacked, and if right, all these attacks would be futile.

M. de Jussieu married twice; first in 1779, and again in 1791. By his first wife he had two daughters; by his last,

a son and a daughter; this son was M. Adrien de Jussieu, Member of the Academy.

Strongly contrasted with his uncle Bernard, whom he closely resembled in all other respects, was M. de Jussieu's preference for society to solitude. His society, certainly, consisted chiefly of his own family, but that family was large, and he had added to its number by adopting two nephews and a niece, the latter of whom subsequently became his son's wife, and whose death they had to deplore in 1831. He was deeply beloved by his whole family; well are known the devoted attentions, of which he was the object, from Madame de Jussieu, his second wife, and Mademoiselle de Jussieu, one of the daughters of his first marriage. And he requited this kindness by the most unbounded attachment to his family, delighting especially in gathering around him his grandchildren, watching their amusements, and rejoicing that his library contained so many books in which the pictures of flowers and animals afforded the little ones amusement. He was particularly fond of young people; like all those who are permitted to see old age, he felt the trials attached to this privilege in the gradual dropping off of all his early friends, but succeeding generations helped to fill the gap, and he died surrounded with youthful botanists, who felt for him both affection and respect.

Old age had bowed M. de Jussieu extremely; he was naturally very tall, and had a strong constitution. He owed to his fondness for walking and habit of occupation (which is the exercise of the mind, and in which he persisted to his last days), and to the affectionate attention of all kinds that were bestowed upon him, an admirable state of health, which suffered scarcely any interruption, and then but slightly, to the close of life. His last malady was not such as to excite apprehension at first; but soon the total and irremediable want of action that supervened in the digestive organs, destroyed all hope of recovery. He died on the 17th September, 1836, eighty-eight years and a half old.

A.
B
C.
Hydrophora minima.
Sphaeria Robertsii

During the nearly half-century which had elapsed since the publication of his great work, M. de Jussieu's preeminence was undisputed. He beheld all the botanists who lived around him, labouring to bring his method to perfection; Desfontaines confirmed it by his beautiful exemplifications of the structure of stems; du Petit Thouars applied it with singular sagacity; Richard, the father of close and minute analysis, whose rigid language is well known, called the author of the Natural Method, "the first Botanist in Europe," all the celebrated botanists who have arisen within this half-century, acknowledged him as their master; to few men was it granted to exercise such influence on the minds of others, and to still fewer to be the witness of it; in short, his career was almost *unique*, stretching for about an equal number of years in the 18th and 19th century, and allied both in its contemporaneous date and its glory, to the two greatest events in natural science that have occurred in these two centuries, the Chemistry of M. Lavoisier, published in 1789, the same year as M. de Jussieu's great work which closes the 18th century, and the *Recherches sur les Ossemens Fossiles*, the production of M. G. Cuvier, with which opens the 19th.

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## V.—*On* SPHÆRIA ROBERTSII. *Hook.*

[*With a Plate.*]

(TAB. I. A.)

OUR figure of *Sphæria Robertsii, Hook. Ic. Pl. tab.* xi., being unaccompanied by any analysis of the fructification, we gladly give one which has been kindly sent to us by the Rev. Mr Berkeley, and we refer to the *Icones Plantarum* for the specific character and description.

TAB. I. A. *Sphæria Robertsii*, as it grows from the bark of the neck of a Larva in New Zealand:—*nat. size.*—*Fig.* 1, 2. Asci with sporidia; *f.* 3. Perithecium:—*magnified.*

## VI.—*On two Minute* Fungi *belonging to the Division* Hyphomycetes. By the Rev. M. J. Berkeley, M.A., F.L.S.

[*With a Figure.*]

(Tab. I. B. C.)

We have every day fresh proof of the little dependance which can be placed upon a mere superficial examination of the objects which come under the attention of the Naturalist. Habits and forms the most similar, belong often to productions of a perfectly different structure, and it is this circumstance amongst others, which makes it so difficult to ascertain accurately the species intended by many of the earlier writers. This is especially the case with many of Tode's species, though, for the state of Mycology at the time in which he wrote, we cannot refuse him a very high degree of merit. The two Fungi of which I propose now to give a short description, resemble each other so exactly, that either might be referred to *Hydrophora minima*, Tode, but nothing can be much more different than their structure. The one I shall not assume, however, to be that species, though it is hardly probable that there should be a third possessing so nearly the same external attributes, and at the same time the structure of the mucoroid group. Of the other, the characters are so curious, that there cannot be the slightest hesitation in proposing a new genera for its reception.

Hydrophora *tenerrima* (n. s.); sparsa, minima, tota alba, stipite sursum flexuoso, apice clavato; capitulo columellis globosis.

Scarcely visible to the naked eye, and when examined with a good pocket lens exhibiting nothing more than a short very slender white thread with a watery colourless globule seated on its apex. Under a high magnifier, the stem is found to be a little flexuous above, and to end in a clavate swelling beyond which is the globose columella, from the base of which is deflected all round over the apex of the stem a delicate frill which at first formed a portion of the pendulum, and by its

rupture leaves a large circular aperture at its base. I am not able to state positively whether there is any organic connexion between the tip of the stem and the columella after the rupture has taken place, or whether they are kept in apposition by means of the frill, though I suspect that such an union does exist. Peridium quite smooth, consisting of two membranes, between which there is often a considerable space, though they are sometimes in close contact. At the place where it separates from the portion which remains attached to the columella, there is often a ring of considerable size. The cavity between the second membrane and the columella is filled with elliptic sporidia, some of which occasionally adhere to the stem.

The whole plant is so minute and delicate, that it is a matter of extreme difficulty to detach it for examination, as it is instantly destroyed if any thing touches it. The only way is to remove it very cautiously, taking care that it shall fall into a dish of water. When fallen it instantly bursts, and it is only by repeated examination that a notion can be formed of its structure, all the parts being so extremely transparent, and the different circles which present themselves so puzzling, that it is difficult to distinguish them accurately. It occurs not unfrequently on fallen branches, especially on the smooth bark of ash in moist weather, but there are seldom more than three or four individuals together. The only way of getting it home in a fit state for examination is to secure a portion of the branch in a box in such a way that nothing shall touch the watery heads. Tode describes the stem in *Hydrophora minima*, as yellow, and it is figured as perfectly straight. Under these circumstances, I have thought it best not to consider my plant as identical with his.

### Endodromia.

Peridio tenerrimo stipite percurso, farcto floccis ramosis radiantibus sporidiisque globosis nucleo mobilissimo.

Endodromia *vitrea.*

Equally minute with the last, and scarcely to be distin-

guished without the help of a high magnifying power. Stem always, I believe, quite straight, slightly attenuated upwards, running completely through the globose meridian; the portion within the peridium is very slender. Peridium very delicate, bursting when immersed in water, and soon breaking up into little granular portions, filled with globose colourless sporidia and radiating branched threads of extreme delicacy. Within each sporidium is a single globose nucleus which moves about within its cells with the greatest activity, from which circumstance I have framed the generic name. I have never seen a phenomenon of this nature before in Fungi, with the exception of the motion of the particles in the milk of Agarics. Unger, however, appears to have seen something of the kind in the orange globules which are so conspicuous in young plants of *A. regma.*

This is found in the same situations, and in the same circumstances as *Hydrophora tenerrima.* The genus is evidently a higher development of *Mucor*, and seems to be an anticipation of *Stemonitis.*

Tab. I. B. Hydrophora tenerrima.

*a.* Plant in which the two membranes are not distinct.

*b.* Do. Showing both the membranes and ring.

*c.* Do. Showing both the membranes, but the ring is not visible. The frill appears also to be deflected from a higher part of the columella.

*d.* Sporidia. All *highly magnified.*

Tab. I. C. Endodromia vitrea.

*a.* Plant before the bursting of the peridium.

*b.* Do. with the peridium just bursting.

*c.* Top of stem with the spores and filaments, the letter (*o*) marks a portion of the peridium of the base breaking up into little granules.

*d.* Top of stem, the filaments and spores having been washed away.

*e.* Spores with their active nuclei. All *highly magnified.*

## VII.—*Notes upon the genus* EPIDENDRUM, *by* PROFESSOR LINDLEY.

HAVING lately had occasion to reconsider the large genus *Epidendrum*, I have been led to attempt its subdivision upon more natural characters than those employed in the Genera and Species of Orchidaceous plants, the result of which is given in the following account of the subgenera I propose to adopt. In limiting them I have had recourse to the organs of vegetation as well as fructification, and I am persuaded that in the whole Orchidaceous order the same means will be necessary in any large genus, for there seems to be a universal tendency to produce a variety of modifications of the stem and leaves under the same organic type.

I.—HORMIDIUM. Caulis pseudobulbosus. Flores sessiles. Labellum adnatum.

II.—EPICLADIUM. Caulis pseudobulbosus (fusiformis). Flores racemosi, e spathâ erumpentes. Labellum liberum.

III.—ENCYCLIUM. Caulis pseudobulbosus. Flores racemosi v. paniculati. Labellum liberum.

IV.—DIACRIUM. Caulis fusiformis apice foliosus. Flores racemosi. Labellum liberum.

V.—AULIZEUM. Caulis fusiformis v. teres, apice foliosus. Flores racemosi. Labellum adnatum in lobos fissum.

VI.—OSMOPHYTUM. Caulis pseudobulbosus v. fusiformis apice foliosus. Flores racemosi. Labellum adnatum indivisum.

VII.—LANIUM. Caulis repens squamatus, ramulos pseudobulbosos v. breves foliosos promens. Pedunculus racemosus v. paniculatus. Flores tomentosi. Labellum adnatum.

VIII.—SPATHIUM. Caulis foliosus, erectus. Pedunculus elongatus e spathâ erumpens. Labellum adnatum.

IX.—AMPHIGLOTTIUM. Caulis foliosus erectus. Pedunculus elongatus squamis imbricatus. Labellum adnatum.

X.—EUEPIDENDRUM. Caulis foliosus. Pedunculus brevis esquamatus. Labellum adnatum.

In some of these I have the following new species to add from my own herbarium or those of my friends.

§ III. Encyclium; *floribus racemosis.*

1. E. *nemorale;* pseudobulbis .... foliis .... scapo apice densè racemoso sub-10-floro pedunculisque scabris, sepalis petalisque lineari-lanceolatis acuminatis æqualibus patentibus, labelli trilobi laciniis lateralibus semiovatis acutiusculis cucullatis intermediâ maximâ ovatâ; callo ad laminæ basin sito obsoleto antrorsùm evanescente.—A beautiful plant, with very large flowers, apparently pink or purple. The sepals and petals are two inches long, and the middle lobe of the lip is an inch long and $\frac{3}{4}$ of an inch broad.—Found by Karwinski, in May, 1827. *Parasitical on trees in Mexico, in groves near Sultepec.* (herb. reg. monac.)

2. E. *pterocarpum;* pseudobulbis ovalibus compressis diphyllis, foliis . . . racemo angusto, sepalis petalisque subæqualibus linearibus acuminatis patentibus, labelli subrotundi trilobi cordati laciniis lateralibus rotundatis intermediâ multò longiore acutâ basi callo pubescente obscurè tridentatâ auctâ, capsulâ ovatâ trialatâ.—The narrow raceme bears about 10 flowers, which in the dried state are of a dull buff, between coriaceous and membranous, but very brittle. The lip seems to be yellow striated with crimson.—*Collected at Teoxomulco, in the Province of Oaxaca, in Mexico, by Karwinski.* (herb. Mart. Zuccar. et reg. monac.)

3. E. *hastatum;* pseudobulbis . . . , foliis . . . , racemo striato 6—7-floro, sepalis petalisque discoloribus lanceolatis acutissimis patentibus, labello subrotundo emarginato subangulato basi utrinque supra unguem lobulo aucto venis baseos elevatis.—A very beautiful species, with deep purple striated sepals and petals, and a broad ivory white lip. The latter has generally a short lateral lobe on each side of its base so as to obtain a hastate form, but occasionally the lobes are wanting. Near E. virgatum, but not panicled.—*San Pedro in the Province of Oaxaca, in Mexico, in the temperate region, Karwinski.* (herb. Mart. et Zuccar.)

4. E. *tripterum;* pseudobulbis ovalibus compressis diphyllis, foliis lineari-oblongis obtusis racemo paucifloro (4—6) subæqualibus, floribus erectis, sepalis petalisque lineari-lanceolatis patulis, labelli trilobi lobis lateralibus linearibus obtusis planis intermedio subrotundo basi angustato undulato venis rugosis elevatis, capsulâ angustâ clavatâ tripterâ.—The whole plant when in bloom little more than six inches high. Flowers apparently dull purple, with a pale lip, on long peduncles, and erect not drooping. Near Ep. ionosmum.—*Teoxomulco, near Oaxaca, in Mexico, Karwinski.* (herb. Mart. Zuccar. et reg. monac.)

§ III. Encyclium; *floribus paniculatis.*

5. E. *flavum;* pseudobulbis ovatis attenuatis 3-phyllis, foliis ensiformibus paniculæ pauciflorae subæqualibus, sepalis petalisque patentibus subæqualibus lineari-oblongis obtusis, labelli trilobi laciniis lateralibus linearibus truncatis intermediâ unguiculatâ obovatâ nudâ, columnâ sub apice auriculatâ.—The leaves of this are rather more than a foot long. The flowers are pale yellow, about an inch and a half in diameter. The inflorescence is only panicled at the base, and is probably very often simple.—*In decaying vegetable matter near the Caza Pintada, in the Province of St Paul's in Brazil.* (herb. Mart.)

6. E. *virgatum;* pseudobulbis . . . . . . , foliis . . . . . , paniculâ virgatâ ramis longis gracilibus, sepalis lanceolatis petalisque duplo angustioribus patentibus discoloribus, labelli hastati lobis lateralibus acutis patentibus intermedio subrotundo-obovato: callo obsoleto acuminato plano pone basin.—The flowers of this are arranged in a very long lax graceful panicle, the branches of which are simple and sometimes as much as a foot long, with nearly twenty flowers on each. The lip is white or nearly so.—*Near Teoxomulco, in the Province of Oaxaca, in Mexico, Karwinski.* (herb. Martii, et Zuccarinii.)

7. E. *graniticum;* pseudobulbis ovatis attenuatis 2-phyllis, foliis ensiformibus paniculâ multiflorâ brevioribus, sepalis

petalisque patentibus lanceolatis subæqualibus acutis, labelli trilobi laciniis lateralibus lineari-oblongis obtusis intermediâ unguiculatâ obovatâ apice inflexo acuto: callo elevato acuminato secus medium canaliculato columnâ sub apice auriculatâ.—A fine species closely allied to E. flavum. It has a panicle regularly branched up to the apex, nearly a foot and a half long, with each side-branch having from 2—4 flowers. According to M. Schomburgk, the sepals and petals are green dotted with purple, the labellum white with a purple stain at its base, the flowers aromatic, the stem six feet high. I have only seen portions of the panicle.—*Among the granitic ridges of the R. Corentyn; also in similar places near the Cayuni and Guiana, among boulders where a little soil has collected, Schomburgk, n.* 195. (herb. propr.)

### § V. Aulizeum.

8. E. *saxatile;* caulibus fusiformibus apice diphyllis, foliis lineari-lanceolatis racemo paucifloro brevioribus, floribus membranaceis, sepalis oblongis petalisque filiformibus labello multo minoribus, labelli subrotundi trilobi laciniis rotundatis subrepandis intermediam bilobam reniformem serratam imbricantibus.—Whole plant less than six inches high. Flowers membranous, reddish purple, with darker longitudinal streaks, as large as in E. Schomburgkii.—*On rocks in the Serra de Piedade o Brazil, Martius.* (herb. Martius.)

9. E. *rupestre;* caulibus filiformibus vaginis membranaceis vestitis diphyllis, foliis lanceolatis acutis pedunculo ancipiti æqualibus, racemo cernuo, bracteis membranaceis acuminatis pedicellis brevioribus, sepalis oblongis petalisque lineari-spathulatis obtusis, labelli trilobi laciniis lateralibus acutis margine postico serratis intermediâ rotundatâ integrâ lineis tribus elevatis rugosis.—Flowers yellow, the size of E. conopseum.—*On bare rocks at the base of Tunguragua, in Peru, where it was found by the late Col. Hall.* (herb. Hooker.)

10. E. *aggregatum;* foliis distichis lanceolatis acuminatissimis racemis oppositifoliis subsessilibus, brevissimis basi squamatis floribus corymbosis, labello adnato subrotundo cordato basi

bilamellato.—A very singular plant, allied to *E. cauliflorum*. The flowers are apparently as large as in *E. nutans*, but they are unexpanded in the specimens before me, and not in a state to show the form of the sepals and petals.—*Peru, Mathews*, 1901. (herb. Hooker, et propr.)

## § VII. Lanium.

11. E. *microphyllum;* caule repente squamato, ramulis foliosis, foliis ovato-oblongis acutis serrulatis racemo terminali tomentoso multo brevioribus, bracteis membranaceis pedicellis filiformibus multo brevioribus, ovario tomentoso, sepalis apice aristatis, petalis linearibus, labello subrotundo aristato venis tribus per medium elevatis.—A small creeping plant, with membranous downy flowers.—*Found in British Guiana, by Mr Schomburgk, but not forming any part of the collections dispersed by him.* (herb. propr.)

12. E. *Avicule;* caule repente squamato, ramulis pseudobulbosis diphyllis, foliis ovatis planis margine lævibus paniculâ tomentosâ multo brevioribus, sepalis lanceolatis acutis tomentosis, petalis linearibus, labello acuto subrhombeo basi bicalloso.—The leaves of this curious plant are about an inch long; the panicle between three and four inches. The flowers are small, and when seen from the back may be not unaptly compared to a little bird in full flight.—*Organ mountains of Brazil, Gardner, no.* 625. (herb. propr.)

## § VIII. Spathium.

13. E. *spathaceum;* foliis . . . . . , racemis alternis densissimis pendulis spathis foliaceis falcatis conduplicatis vix longioribus, sepalis rigidis striatis acutis, petalis filiformibus, labelli trilobi laciniis lateralibus subintegris intermediâ ovali obtusâ basi bilamellatâ brevioribus.—The masses of inflorescence of this plant are upwards of one and a half foot long, and consist of dense racemes proceeding from the axil of falcate spathes, so as to have a great resemblance to that of some Palm.—*Peru. Obtained by Mr Mathews out of the herbarium of Ruiz and Pavon, preserved at Lima.* (herb. Hooker.)

14. E. *adenoglossum;* foliis carnosis lineari-oblongis obtusis, racemo elongato simplici terminali e spathâ ancipiti pedunculo breviore orto, sepalis ovatis reticulatis, petalis linearibus 3-veniis acutis, labello lineari basi callis 3 instructo.—*Peru, near Pangoa, Mathews*, 1073. (herb. Hooker.)

15. E. *grandiflorum;* foliis distichis ensiformibus obtusis, racemo denso terminali basi flexuoso e spathâ duplici orto, sepalo dorsali ovali lateralibus duplo latioribus dimidiatis, petalis linearibus, labello subrotundo cordato emarginato margine postico crispo venis baseos 2 elevatis.—A plant with the inflorescence of E. variegatum. Flowers coriaceous, about twice as large as in that species.—*Peru, Mathews*, 1871. (herb. Hooker.)

16. E. *ventricosum;* foliis lineari-lanceolatis acutis, racemis angustis multifloris e spathâ lineari ortis, floribus membranaceis, sepalis subæqualibus oblongis acutis, petalis filiformibus, columnâ ventricosâ, labello ovato cordato acutissimo basi bicalloso.—A slender plant, with the stem about six inches up to the commencement of the spathe. Racemes from 4—5 inches long, including the spathe which covers the whole peduncle. Flowers purple, small, membranous.—*Peru, Mathews*, 1869. (herb. Hooker.)

§ IX. Amphiglottium; *floribus racemosis.*

17. E. *cornutum;* foliis gramineis lineari-lanceolatis acutissimis, racemo elongato cylindraceo cernuo, sepalis lineari-lanceolatis acuminatis striatis, petalis filiformibus, labelli trilobi laciniis lateralibus nanis rotundatis intermediâ cornutâ basi 3-callosâ.—Near E. Trinitatis. Spathaceous bracts acuminate, imbricated, as long as the peduncle. Raceme 6 inches long. Flowers white, very fragrant.—*Peru, Mathews*, 1895; *on trunks of trees at Guachapalo near Cunca, Jameson.* (herb. Hooker, and propr.)

§ Amphiglottium; *floribus paniculatis.*

18. E. *porphyreum;* foliis distichis oblongis acutissimis, squamis spathaceis dense imbricatis acuminatis pedunculo longioribus, paniculâ acutâ simplici multiflorâ, floribus corymbosis,

sepalis oblongis acutis lateralibus falcatis, petalis lineari-spathulatis, labelli trilobi laciniis lateralibus rotundatis intermediâ quadratâ bidentatâ: disci axi elevatâ basi et apicem versus bicallosâ.—A fine species with an oval panicle and large flowers like those of E. nutans, but purple.—*Found by Professor Jameson, in the woods on the western side of Pichincha,* (herb. Hooker.)

§ X. Euepidendrum; *floribus paniculatis.*

19. E. *erubescens;* foliis oblongo-lanceolatis acutis scapo pluries brevioribus, paniculâ amplissimâ flexuosâ, petalis unguiculatis sepalisque oblongis obtusis, labelli trilobi laciniâ intermediâ subrotundâ venis 3 elevatis lateralibus obovatis multo majore.—A magnificent plant, with very large panicles of delicate rose-coloured flowers as large as those of E. alatum.—*Found at las Animas, near Oaxaca, in Mexico, by Karwinski.* (herb. Martii et Zuccarinii.)

20. E. *durum;* foliis distichis ovato-lanceolatis acutis: vaginis rugosis, paniculâ simplici paucíflorâ, bracteis duris ovatis cucullatis acuminatis ovariis æqualibus, sepalis oblongis acutis duris striatis, petalis angustioribus, labelli postici trilobi transversè rhombei lobis lateralibus erectis truncatis intermedio triangulari acuto.—Stems simple or branched, from 9 to 18 inches high, equally covered with hard distichous leaves. Flowers small, apparently yellow. The inflorescence is occasionally simple.—*Guiana, Schomburgk; Villa Rica in Brazil, Pohl.* (herb. Martii, Zuccarinii et propr.)

21. E. *carnosum;* foliis distichis ovato-lanceolatis acutiusculis: vaginis rugulosis, paniculâ rigidâ striatâ multiflorâ, bracteis duris ovatis cucullatis acutis ovarii longitudine, sepalis carnosis oblongis obtusis lateralibus hinc gibbosis carinatis latioribus, petalis sepalo dorsali conformibus, labelli postici trilobi carnosi lobis lateralibus rotundatis erectis intermedio conico solido.—A rigid plant, with the habit of Epid. elongatum. The panicle is stiff, many-flowered. Flowers are pale yellow according to the MSS. notes of Dr von Martius; they are when dry, hard, thick, and black, and evidently must be very fleshy when recent.—*Dr von Martius met with this species in*

*the Diamond Plains near Tejuco, and in rocky places near Itambe in Brazil; Pohl also found it in the same country* (herb. Martii and Zuccarinii.)

22. E. *micranthum;* foliis distichis lineari-lanceolatis acuminatis, paniculâ virgatâ, bracteis setaceo-acuminatis florum dissitorum longitudine, sepalis oblongis carnosis obtusis subæqualibus, petalis linearibus, labello oblongo quadrato indiviso nudo.—A plant with flowers scarcely a line long, and all the habit of Ep. tridactylum.—*Peru, Mathews,* (1858.) (herb. Hooker, Bentham et propr.)

§ Euepidendrum; *floribus paniculatis.*

23. E. *vincentinum;* caule ancipiti, foliis distichis anguste lanceolatis acutissimis paniculâ pauciflorâ laxâ filiformi brevioribus, sepalis lineari-lanceolatis, petalis filiformibus, labello subrotundo crispo.—A small delicate species, not more than 4 inches high, with minute membranous flowers, disposed in a short, loose panicle; filiform pedicels.—*St Vincents, Guilding.*—(herb. Hooker.)

§ Euepidendrum; *floribus racemosis.*

24. E. *alternans;* foliis distichis oblongo-linearibus oblique retusis margine vaginisque scabris, racemo angusto terminali, floribus subsessilibus, sepalis linearibus retusis, petalis conformibus serratis, labello subrotundo-ovato serrato bilamellato columnæ nanæ adnato. *Var. α.* bracteis ovatis herbaceis obtusis pedicello longioribus, racemo corymboso, floribus majoribus. *Var. β.* bracteis minimis acutis pedicello brevioribus, racemo flexuoso, floribus duplo minoribus.—Slender plants about six inches high, with small racemose flowers. The *var. β.* is smaller in all its parts, but in the structure of the flowers themselves I find no appreciable difference.—*The var. α. was collected in the ravines of Pichincha, at the height of* 10,000 *feet above the sea, by Professor Jameson; β. is from San Carlos in Peru, and is No.* 1897 *of Mathews' collections.* (herb. Hooker et propr.)

25. E. *tenue;* foliis distichis linearibus acuminatis oblique emarginatis, racemis acutis angustis simplicissimis (nunc casu

Allan & Ferguson lithog.

quodam bifidis multifloris (10—20), bracteis ovatis acutis rigidis cucullatis pedicello longioribus, floribus erectis membranaceis, sepalis linearibus obtusis, petalis filiformibus, labello sessili ovato acuto concavo utrinque 1-dentato : venis baseos elevatis.—A small slender species with the habit of the last.—*Found by Dr von Martius in the Serra do Caraca, in the Province of the Mines, in Brazil.* (herb. Mart.).

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## VIII.—*On a new species of* Fissidens, *found by* T. G. Lea, Esq., *in North America.*

[*With a Figure.*]

(Tab. II.)

Fissidens *hyalinus* (Wils. et Hook.) ; pumila erecta simplex, foliis oblongis acutis reticulatis hyalinis enervibus, seta terminali, capsula erecta ovata, operculo conico-acuminato. Hab. Cincinnati, N. America. *T. G. Lea, Esq.* Rare on damp earth in moist shady woods.

Amongst an extensive and interesting collection of North American Mosses, sent to us by T. G. Lea, Esq., from Cincinnati, we find the very remarkable one of which we here offer a figure. No other species that we are acquainted with is destitute of nerve, or has the leaves so loosely cellular, or so pellucid as the present.

The plant grows in small tufts upon the ground. The stems scarcely exceed a line in length, are simple, throwing out a few fibrous radicles from the base. The leaves are from 4—6, very large in proportion to the size of the plant, distichous, unequal in size, oblong, acute, equitant in the upper half of the base, pellucid, entire, loosely reticulated, with oblong cellules, quite entire, and quite destitute of nerve. Seta rather thick, whitish, and semi-pellucid, terminal arising from an oblong bulb, curved. Capsule erect, ovate. Operculum shorter than the capsule, conico-acuminate. Calyptra mitriform. Teeth of the peristome 16, when moist strongly incurved and concealed in the mouth of the capsule, red, deeply cut into two narrow subulate laciniæ.

Tab. II. *Fig.* 1. Plants, *nat. size; f.* 2. Single plant; *f.* 3. Calyptra; *f.* 4. Tooth of the peristome:—*magnified.*

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## IX.—*On a new N. American* Grimmia, *by* W. Wilson, Esq.

[*With a Figure.*]

(Tab. III.)

### Grimmia Drummondii.

Caule subsimplici, foliis patulis lineari-lanceolatis acutis subcarinatis siccitate crispatis, capsulâ ellipticâ exannulatâ, operculo rostrato, calyptrâ sulcatâ, peristomio immerso.

Hab. On trees in Louisiana. *Drummond.*

*Caules* semunciales, erecti, aggregati. *Folia* patulo-reflexa, lineari-lanceolata, acuminulata, integerrima, canaliculata, crassiuscula nervo subcontinuo, siccitate valde crispatâ, absque nitore. *Seta* brevis, foliis triplo longior. *Capsula* erecta, oblongo-elliptica, ore rubro. *Peristomii dentes* sedecim, infra marginem capsulæ adnati, conniventes, latè subulati, subinde perforati, apice vix fissi, externe facie leniter trabeculati, saturate fulvi, basin versus rubri. *Calyptra* campanulata, flavo-brunnea, sulcata, basi lacera, capsulâ brevior, illamque amplectens. *Operculum* e basi convexo rostratum, rectum, capsulâ paulo brevius.

The absence of an annulus in this species, the immersed peristome, and the more crisped dry foliage, are marks whereby this species may be readily distinguished from *Gr. Muhlenbergii* and *Gr. crispata*, between which it is intermediate in size.

*Obs.* In the original Cape specimens of *G. crispata* the capsule is subpyriform, *i.e.* tapering at the base, and the teeth of the peristome *have no medial line*, though so represented in the figure in Miscel. Bot.; an annulus is present.—W.

Reference to Figure.—Tab. III. *Fig.* 1. Plants, *nat. size; f.* 2. Magnified; *f.* 3. Capsule with calyptra; *f.* 4. Leaf magnified; *f.* 5. Apex of leaf, highly magnified; *f.* 6. Section of leaf; *f.* 7. Portion of the peristome.

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*Grimmia Drummondii*

Anomalous Plum

## X.—*Remarks on an anomalous form of the* PLUM, *observed in the Gardens of New Brunswick, North America.* By JAMES ROBB, M.D., Professor of Natural History in King's College, Fredericton, New Brunswick.

[*With Figures.*]

(TAB. IV.)

WITH the exception of the *Siberian Crab,* there are no trees in the gardens of New Brunswick, which show such a profusion of blossoms as those of the *Plum* tribe. Of these there are three kinds to be found almost everywhere; one bearing a small black damascene plum, another a red one, (very like our common plum,) and the third a smaller red plum, containing a roundish flattened stone, somewhat like a tamarind stone, and having a deep groove on one side.

But though all these varieties flower with the utmost luxuriance, few of them ever produce ripe fruit; a crop of plums is not gathered oftener perhaps than once in five years; during the last three years there have been almost none, and the tree which in June is white with blossoms, will be found in September with two or three or perhaps ten good plums upon it. Owing to the recent settlement of the province, our fruit-trees are mostly all young, and introduced from the gardens of the United States; yet young as they are, their stems and branches are very frequently encrusted with Lichens and Mosses.

The same remark applies to the cherry and apple-trees, the latter of which especially are liable to degenerate, and no mode of treatment hitherto tried will secure for any length of time a fine quality of fruit. Almost all the apples seen at table are imported from Boston; those grown in New Brunswick being chiefly consumed in the manufacture of cyder.

In the summer of 1839, I had an opportunity of watching the progress of destruction among the plums, and it was as follows. Before, or soon after the segments of the corolla had fallen off, the ovarium had become greenish-yellow, soft and

flabby; as the fruit continued to increase in magnitude, its colour grew darker, and of a more ruddy yellow, and at the end of a fortnight or three weeks, the size of the abortive fruit rather exceeded that of a ripe walnut. In fact, an observer might imagine himself to be walking amongst trees laden with ripe apricots, but like the fabled fruit on the banks of the Dead Sea, these plums, though tempting to the eye, when examined were found to be hollow, containing air, and consisting only of a distended skin, insipid and tasteless. By and by, a greenish mould is developed on the surface of the blighted fruit, then the surface becomes black and shrivelled, and at the expiration of a month from the time of flowering, the whole are rotten and decomposed. The flower appears about the beginning of June, and before August there is hardly a plum to be seen.

The same phenomenon occurred this year, only that many more advanced to maturity in the natural way, and I dare say there will be a good number of plums ripened this season. What is also curious is that, if there be two flower-stalks from the same point in the branch, one of the ovaria will often go on to ripen in the normal way, while the other will become abortive and wither, as above described. Sometimes the abortive fruits turn mouldy and rotten, while small; at other times they assume a rounded figure, and are larger than a ripe fruit ought to be; while again the carpel will occasionally become as much elongated as the pod of a leguminous plant. The latter form was observed to have once occurred in a garden at Sullen in Chablais, and this is the only instance which I can discover on record of any such degeneration of the fruit of the Plum-tree. It is mentioned by M. De Candolle, in his *Memoir on the Leguminosæ*, where he is trying to establish the analogy between the plants belonging to the *Rosaceous*, and those of the *Leguminous* families.

On examining one of these abortive fruits, we find matter deserving of attention and record; indeed, all anomalous forms, whether in the animal or vegetable kingdom, are in the highest degree worthy of study. Modern science is now

most profitably directed to the subject of analogies, and nothing is so likely to confirm theories derived from a study of the normal organization, as the finding that these theories apply equally to the same organization when in an abnormal (or as it was formerly called, a monstrous) form. In fact, we are persuaded that theories which do not apply to those monsters, and readily explain them, are expressed in terms either not correct, or not sufficiently general. Monsters, whether of the animal or vegetable type, are cases left us by nature, to instruct us how she forms the perfect individual, and when and why her usual operations may be varied and suspended in their progress. There is perhaps no theory which has thrown so much light upon vegetable physiology, as that proposed by Goethe, in regard to the analogies which exist between a flower-bud and a leaf-bud. According to this theory, the origin of the parts composing the flower-bud, is the same as that of the parts contained in a simple leaf-bud. Thus, all the bracteas, the sepals, the petals, the stamens, the pieces of the nectary, and the ovarium, are subject to the same laws of arrangement as the leaves themselves; in other words, there was a time in the early life of the bud, when the parts composing it might either have been developed into leaves, stipules, tendrils and branches, or bracteæ, sepals, petals, stamens, nectaries and ovarium. Botanists know that we are in some cases able to see on the normal plant, a transition from the one to the other form; that we may, by appropriate treatment, cause the one to revert back to the other, and that we can also in many cases of spontaneous anomaly, trace incontestible evidence of this process of metamorphosis or change having been effected. By the theory just hinted at, we are made aware that if the fruit be a developed ovarium, and if an ovarium be only a modified leaf or leaves, that the fruit may often exhibit proofs of its foliaceous origin. It is not to be understood that a monocarpous or a polycarpous fruit was ever a single leaf or several leaves, but rather that it *might have been such*, if it

had not been determined otherwise by the specific vital energy of the plants, or of that part of the plant.

To avoid misunderstanding, then, it will be convenient to adopt the word *Protophyllum*, when speaking of any of the elements of a bud which in theory might have become any of the parts either of a flower or of a branch.

The abortive plum, now under consideration, offers a striking confirmation of the theory of the German poet and philosopher, as we shall now proceed to state.

The fruit or *pericarp* of the genus *Prunus*, is simple, that is, the convolute *Protophyllum* of the ovary is single. In the normal form of this fruit, the exterior coloured *exocarp* is analogous to the *Hypophyllum* or *Epidermis*, on the lower side of a leaf; the *Mesocarp*, thick and fleshy, (constituting the part that is eaten), is analogous to the *Mesophyllum*, or cellular tissue of a leaf; and the *Endocarp*, hard and long, represents the *Epiphyllum* or *Epidermis* of the upper surface of a leaf, thus:—

Hypophyllum = exocarp.
Mesophyllum = mesocarp.
Epiphyllum = endocarp.

In the anomalous fruit, now before us, each of these parts has its representative, but they are in conditions widely different from the normal one. Thus, the *exocarp* is yellow and wrinkled, not smooth and red or black; while the *mesocarp* is as little developed as if the *protophyllum* had become a leaf. Its cells are loose and dry, while the vessels, large and very prominent, are discerned passing through it. These are seen to start from the peduncle, and to divide into several sets or bundles, and to pass upwards on all sides towards the apex, where the withered style is attached. The two largest sets of vessels are those which run up along the inner surface of the groove or suture, corresponding to the line along which the edges of the protophyllum are united, and those which correspond in position with the midrib in the *protophyllum*. These two sets, and the other smaller ones, all anastomose

with each other, and finally converge towards the apex, where probably they all contribute to form portions of the style and stigma.

The *endocarp*, about as large as a coffee-bean, was membranous, and extremely vascular on its internal surface. In general, it was attached by vascular fibres, derived solely from the point of origin; but sometimes there were adhesions between its sides, and the tissue of the mesocarp on which it lay; along one of its edges it was sometimes wholly or in part open, and this opening corresponded with the suture or groove on the outer covering: sometimes it was attached near to where the style was fallen off; in other instances it was attached midway between that point and the peduncle. In some specimens it was empty and collapsed, while in others the rudiments of one or two *ovules* might be seen. These were not apparently connected with the endocarp; but only with a bundle of vessels and a fine transparent membrane proceeding from the inner surface of the suture, representing the conjoined margins of the *protophyllum*. One of the two *ovules* was generally smaller than the other; and though neither of them were bigger than a pin's head, yet even thus early was it signified that the nutrition of one of the two ovules was deficient.

The structure of one of these two ovules was not unlike that of a regularly formed ovule, and the whole was analogous to that of the fruit itself, considered without reference to the ovule. For the whole was plainly seen to consist of a series of sacs, contained (*emboités*) one within the other, and touching each other at the neck only. Each ovule was made up of three transparent shut sacs; the innermost of which, (representing perhaps the tercine of M. Mirbel,) contained a transparent fluid and nothing more, so far as I could discover. The repetition of the same form of sac within sac, and the connexion of the whole with the vessels running from the peduncle to the stigma, and constituting a true placenta, is extremely remarkable, and helps to throw some light on the structure of the fruit in general. As there was no provision

made for the nutrition of the *embryo*, it is natural to expect that it would not be developed, nor was it to be found. The ovule then either was not fecundated, or it was destroyed soon after fecundation. Now, as all the parts of a fruit concur towards the development and protection of the new individual,—if the new individual be not formed, then the other parts need not be developed either, which was precisely the case, as I imagine, in the present instance. By a reference to my Meteorological Journal, it appears that the mean daily temperature in Fredericton in the early part of June, 1839 and 1840, was sometimes at 50°, 60°, or 70°, (Fahr.) in the shade; but yet that there were frequent cold winds from the north and east, and north-east, with heavy rains, continuing for days together, just at the period that the *Plum-trees* were in flower. May and June constitute in fact the rainy season of New Brunswick; the air, cooled by the melted ice and snow, is subjected to the rays of an already powerful sun, and the weather thus becomes extremely changeable and uncertain. In the garden where I obtained the specimens accompanying this paper, every tree was blighted, except one which was close upon a stable, and thus protected from the north and east. On the tree in question there was not a single blighted plum. It would perhaps be a too hasty generalization to say that this explains the whole matter; but probably, the abortive fruit of the plum-tree, and the curious appearances above described, may be considered to be materially influenced in their production by the occurrence of cold winds, and long-continued rains during that season when the inflorescence is expanded, and the reproductive organs are of course the most exposed to atmospherical vicissitudes.

The people of Fredericton assert that this blight of the fruit is owing to insects, and that it may be cured by lime-water; I have however examined with the glass hundreds of trees, and never could detect any thing but a few *Aphides* on the leaves, too few, of course, to effect so much mischief. The soil may exert some influence; but the soil in different gardens is not often alike, and a reference to this cause could

not suffice to explain any effect which is so very general. If my opinion upon the true origin of the evil be contrary to that of more experienced Horticulturists, I shall be only too happy to accept any more rational explanation of the facts described in the foregoing pages.

J. ROBB, M.D.

*Explanation of the Plate. Tab. IV.*

Fig. 1. Ordinary form of the abortive fruit, *nat. size.*

*a.* Peduncle.

*b.* Withered remains of corolla and stamen.

*c.* Groove or suture, indicating the edges of the protophyllum.

*d.* Withered style.

*e.* Normal form of the fruit.

Fig. 2. Abortive plum which has become elongated like a pod, *nat. size.*

Fig. 3. Another variety, rounded and much corrugated, *nat. size.*

Fig. 4. Section of Fig. 1., a little magnified.

*f. f.* Cut edges of exocarp.

*g.* Cellular tissue of mesocarp.

*h.* Large bundle of vessels, reaching from the peduncle to the base of the style, and corresponding to the placenta in leguminous plants.

*i.* Endocarp, suspended from the placental vessels, and being almost loose on the mesocarp.

*k.* Section of a plum, ripening in the normal way.

Fig. 5. Magnified view of a piece of the carpel, to show the attachment of the endocarp.

*l. l.* Marginal vessels of the protophyllum.

*m.* Funicle or vascular connexion of the ovule, and its coverings.

Fig. 6. Endocarp, opened and magnified, to show the ovules.

*i.* Internal surface of the endocarp.

*m.* Funicle or vascular cord.

*n. o.* The two ovules not attached to each other.

*p.* Vessels going off from the placenta, to one of the ovules.

Fig. 7. Magnified section of one of the ovules.

*p.* Connecting vessels.

*q.* Membrane, by which the ovule is also attached.

*r.* Cut edge of the outer sac.

*s.* Cut edge of the middle sac.

*t.* Innermost shut sac containing a clear fluid.

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## XI.—*A Sketch of the Progress of Botany in Western America.* By C. W. Short, M.D.

[*From the Transylvania Journal of Medicine, No. XXXV.*]

[The *Flora* of North America has long occupied much of our attention; and thanks to the liberality of our own Botanists and those of the United States, there is no herbarium in Europe that includes so large a collection of American plants as our own. We have ourselves in the *Edinburgh*

*Philosophical Journal,* some years ago, given an account of the progress of Botany in the northern half of the New World; and have in the *Botanical Miscellany,* and the *Companion to the Botanical Magazine,* and in the first volume of this *Journal,* published an account of the botanical travels of Dr Scouller, Mr Douglas, and Mr Drummond, together with many of their plants; whilst our *Flora Boreali-Americana,* bears testimony to the exertions of those very individuals, as well as of Dr Richardson, and the other officers of our expeditions in search of a north-west passage through the seas of Arctic America, in the *British possessions.* It was reserved for our valued friend and correspondent, Dr Short of Lexington University, to enlarge more particularly on the discoveries that have been made in the western territories of the United States, and we gladly give insertion to his interesting sketch in the pages of our *Journal.* Four years indeed have elapsed since this paper was written, and Mr Nuttall's most extensive and important travels to the Pacific remain yet to be detailed. We trust, at a future period, to be able to resume this subject, and to bring forward many particulars of the labours of others, who have contributed to enrich the *North American Flora* of Messrs Torrey and Gray, one of the most valuable botanical works that has ever issued from the press, whether in the Old or in the New World.—Ed.]

In the rapid increase of knowledge which has distinguished the close of the eighteenth and the commencement of the nineteenth century, every department of science has felt the animating influence of improvement. In every branch of knowledge, and particularly in those which depend on facts and observations for their support, the increase and improvement has been great and rapid; and in every branch of Natural History these results are particularly striking. Zoology is no longer the study of one individual; quadrupeds and birds, and fish and insects are become distinct pursuits; even the different orders of insects have attracted and fully occupied different observers, and their forms and habits and splendid drapery have been noted and delineated, until the imagination is almost become wearied with contemplating the boundless variety of organized beings, and the variety scarcely less boundless of habits, instincts, and qualities. Mineralogy and Geology, though each treating of the same inorganic portions of the globe, have become divided into distinct studies, each fully occupying all the powers of the most gifted minds.

It is scarcely a century since Botany began to claim any of the distinctions of a science; at a much later period it was considered as so small a branch of the department of Natural History, that it was generally included in it as a subordinate, although always a favourite study. Even now it may be correctly viewed under the same aspect; but so wonderfully have the branches of this great stock expanded, that Botany may now be said to comprehend many ramifications dependent on itself, each of which may occupy and amuse the leisure hours of a long life. Vegetable physiology—the distribution of plants into definite groups, comprehending the principles of classification—descriptive botany, or an examination and description of all the species of which the vegetable kingdom is composed—and even the history of the science, are each of them inquiries of great extent. In descriptive botany, instead of the limit which was once supposed to circumscribe its objects, instead of ten thousand species which Linnæus, with all his knowledge and in the height of his enthusiasm, believed would comprehend all the existing forms of vegetable life, we will not say in the language of poetry, that ten thousand times ten thousand are rising up before us, but it is well known that the ascertained species are rapidly approaching to one hundred thousand, and new species, we may safely say, new genera, if not new families, are annually added to the long catalogue of recorded names.

Nor should the perpetual expansion of this circumference deter the lover of Natural History from engaging in its pursuit. It should rather be a gratification and an incentive to him, that his occupation will be interminable—that curiosity, in itself insatiable, shall be supplied by fountains in themselves exhaustless; and whilst the conqueror of the world wept that he had no more to do, the student of Nature need never apprehend, that with the most industrious devotion of the longest life, he will ever exhaust the sources of his enjoyment. In no pursuit, perhaps, in which man engages, does he enter with so pure and disinterested an enthusiasm, with such devoted and exclusive ardour. There

is none in which successful results appear to give more unmingled pleasure. *Labor ipse voluptas*, is the motto which is always inscribed on his banner.*

Amidst this ample range which Botany now opens to our view, we must on the present occasion necessarily restrict our researches within very narrow bounds, and we, therefore, propose devoting this paper to a sketch of the progress of Botany in Western America. In doing this, we will advert to the labours of those only who have been instrumental in forwarding the march of this science, and promoting its discoveries in the more recently explored and newly settled portions of our continent: and for the sake of greater convenience will mention them in the order of chronological occurrence.

The first scientific botanist who visited this portion of the Union, was André Michaux, the elder, who having studied the science under the great Jussieu, and other eminent teachers, having visited various portions of France on botanical excursions, and accompanied the Persian consul to the East, where he spent two years in the exploration of its vegetable treasures, may be supposed to have been well qualified for the task to which he was selected by his royal master, Louis the Sixteenth—that of exploring the continent of North America. In 1785 he sailed from France, on this mission, and for ten years was industriously engaged in examining various portions of the Continent, from Hudson's Bay, to the Bahama Islands; and from the Atlantic seaboard, to the banks of the Mississippi. For the purpose of assisting him in transporting his collections of living plants and roots to Europe, he formed establishments at New York, and Charleston in South Carolina, for their cultivation; and spent a considerable portion of his time in the latter city, when not engaged in his excursions. These establishments were soon brought into a flourishing condition, and besides effecting the objects for which they were especially instituted,

* Elliott in the Southern Review, No. viii.

did much towards advancing the science of Arboriculture in the United States.

In the year 1793, Michaux crossed the Alleghany mountains, and visited many portions of the Western country; he traversed Kentucky, and spent some time in this place. In the following year, 1794, he again descended the Ohio river, and pushed his investigations into the interior of Illinois, even to the borders of the Mississippi. The difficulties, privations and dangers to which this enthusiastic naturalist was exposed at that early day, in these unsettled wilds, may be easily imagined; but we can as readily conceive, that these all were more than balanced in his mind, by the delights which he experienced in traversing a heretofore untrodden region, through which, in reference to the lights of science and the labours of civilization, it may truly be said,

> "He bent his way where twilight reigns sublime
> O'er forests silent since the birth of time."

In 1796, this father of American Botany returned to Europe, richly laden with the materials for a comprehensive work on the Flora of North America. But finding his country in a distracted state, growing out of the Revolution, he was induced to postpone the publication of his works, and to join an expedition then about to sail for New Holland; on which, after having visited Teneriffe, and the Isle of France, he died at Madagascar, in November, 1802.

Previously to this, however, his son Francis André Michaux, commonly styled Michaux the younger, who had been with his father in America, returned hither in the year 1801, under the auspices of M. Chaptal, Minister of France for the interior, and spent nearly two years more, in further investigations of the natural productions, especially of the Carolinas, Kentucky, and Tennessee. These were made during a journey from the city of New York as far west as Nashville, and thence to Charleston. On this travel, he diligently examined that portion of our State bordering on the Ohio river above Maysville; and thence through the interior by the way of Lexington, to the Barrens. A narrative of

this journey was published by him on his return to Paris, in which he speaks in terms of respect and gratitude, of the civilities and assistance which he received, during his stay in Lexington, from Dr Samuel Brown, late Professor of the Theory and Practice of Medicine in Transylvania University.

Soon after the return of Michaux the younger to Europe, he published in Paris two works of which his father had left the MSS. These were the *Flora Boreali-Americana*, in two volumes, 8vo. and one volume on the *Oaks of North America*, in folio. The former of these was the first publication ever given to the world on the general Botany of North America; for although partial Floras of particular districts had been previously given by Cornutus, Catesby, Walter, Clayton, Gronovius, Marshall and others, yet these were all necessarily imperfect and limited. The work of Michaux comprised descriptions of 1700 plants, and about forty new Genera.

Of these acquisitions made by Michaux to the Botany of America, our own State and her sister Tennessee have the honour of having furnished a due proportion; and among them some curious in their economy, and others imposing in appearance. We have only time at present to allude to the *Pachysandra procumbens*, flowering among the snows of February—the aquatic *Hydropeltis purpurea*, defended from the action of the water by a thick glutinous covering—the humble but useful *Podostemum ceratophyllum*, confined to the shoals of the most rapid rivers, where it serves to protect the channel from the fury of the current, by binding together gravel, shells, and stones, on one impenetrable mass—the little *Poa reptans* performing the same office by matting together the dry sands of the river bank—the graceful *Virgilia lutea*, decorating our calcareous cliffs with its long pendant racemes of snow-white flowers, &c.

His characteristic descriptions given in pure and classic Latin are exceedingly faithful; and subsequent investigations have but served to confirm the fidelity of these descriptions and the accuracy of his localities. Of this we will adduce

but a few proofs out of many which might be cited. In speaking of the *sedum pusillum*, Michaux mentions it as being found in North Carolina, at a place called "The Flat-Rock." Pursh, the author of another and later work on American Botany which we shall presently mention, in describing the same plant after Michaux, but without his precise accuracy, says, that it is met with "on flat rocks in North Carolina" and elsewhere. Now, although this little latitude in the most of instances might safely be indulged in, as similar plants are for the most part found in similar localities in the same countries, yet in the present instance it has proved unfavourable to Pursh; for Mr Nuttall, of whom we shall hereafter speak more particularly, writing to us some years ago, on the subject of this particular plant, and its peculiar and restricted locality, thus expresses himself. "On this singular rock of granite of nearly five acres area, I had for the first time, during my numerous peregrinations in the United States, the satisfaction of meeting with this extremely rare plant, and upon the same rock where so long before the unfortunate André Michaux had found it; from that time to the present no one except Michaux and myself had ever collected or met with it—it has never yet been any where found, but on the 'Flat-Rock,' near Camden, in North Carolina." The *Bellis integrifolia*, or American daisy, first described by Michaux in the work now noticed, the existence of which was even questioned by some American Botanists, has since been found abundantly in Kentucky and Arkansas. And it has been our good fortune to detect the original *Cunila glabella* of this author, in the neighbourhood of Lexington, though long confounded with a totally distinct species growing around the falls of Niagara.

Besides the *Flora Boreali-Americana* and the volume on American Oaks by the elder Michaux, we are indebted to the younger for a splendid work on the forest trees of our country, the *Sylva Americana*, forming with the Oaks, three large volumes, with beautiful and highly accurate coloured engravings. Of this work, which should be in the library of every intelli-

gent farmer and physician, two or three editions have been published in Europe, and one in America.

The estimable and venerable author of this work is now living in the neighbourhood of Paris, in France; and to him we had the pleasure, a short time since, of sending by Dr Campbell of Tennessee, a small parcel of plants, being chiefly such as have been discovered in this country, since the travels of his father and himself.

Soon after the purchase of Louisiana, the Government of the United States wisely determined upon taking measures to explore their newly acquired territory, and the immense wilderness included within its limits, in order to learn its geographical boundaries, its soil, and natural productions. As intimately connected with the investigation before us, and as next in the order of their occurrence, we must mention the labours of those intrepid explorers Lewis and Clark, who at the instance of President Jefferson were sent in 1803 to the Western portions of our Northern continent, up the Missouri, over the Rocky mountains, and down the Columbia to the shores of the Pacific. Of the fitness of Capt. Lewis for the command of such an expedition, the President thus expresses himself in his recommendation to Congress. "Of courage undaunted; possessing a firmness and perseverance of purpose which nothing but impossibilities could divert from its direction; careful as a father of those committed to his care, yet steady in the maintenance of order and discipline; intimate with the Indian character, customs, and principles; habituated to the hunting life; guarded by exact observation of the vegetables and animals of his own country, against losing time in the description of objects already possessed; honest, disinterested, liberal, of sound understanding, and a fidelity to truth so scrupulous, that whatever he should report would be as certain as if seen by ourselves: with all these qualifications, as if selected and implanted by nature in one body for this express purpose, I could have no hesitation in confiding the enterprise to him." Under this leader was this daring enterprise accomplished in three years, to the entire satisfaction of the government.

It is much to be regretted, however, for the cause of Natural Science, that the wisdom of President Jefferson had not perceived the necessity of attaching to this expedition some thoroughly competent naturalist; for whatever may have been the tact and discernment in observation, possessed by Capt. Lewis, he was not prepared by previous education for making those accurate and minute observations, collections, and reports, on the Botany, Mineralogy, and Zoology of those unknown regions, which would have proved most interesting and useful to his own country, and to the world at large. For making these, facilities and opportunities were enjoyed by this expedition which have not been possessed by any subsequent party. Nor were they entirely unimproved by our travellers; for a large collection of plants was made during their slow and tedious ascent of the Missouri, which, however, was most unfortunately lost by being deposited among other things at the foot of the Rocky mountains. A much smaller, but still highly interesting collection, made during the rapid return of the expedition, was placed in the hands of Pursh, a distinguished botanist, of whom we shall presently speak, for the purpose of figuring and describing such as might be new. Of this parcel, Pursh thus speaks:—"The loss of the first collection is the more to be regretted when I consider that the small collection communicated to me, consisting of about one hundred and fifty specimens, contained not above a dozen plants well known to be natives of North America; the rest being either entirely new or but little known, and among them at least six distinct and new genera. This may give an idea of the discerning eye of their collector, who had but little practical knowledge of the Flora of North America, as also of the richness of those extensive regions in new and interesting plants and other natural productions." What then might not have been the acquisitions made to the Flora of Western America, had this expedition been provided with competent naturalists!

At the same time that Capts. Lewis and Clarke were performing their arduous and important services in exploring the

unknown sources of the Missouri, Capt. Zebulon Pike, another highly meritorious officer, was despatched on a similar expedition, for the purpose of tracing the Mississippi to its head; and although but ill provided with the proper outfit, and labouring, consequently, under many disadvantages, he nevertheless effected the main object of his mission, in nine months, to the satisfaction of Government; and immediately on his return was selected by Gen. Wilkinson for a second expedition to the interior of Louisiana, which he prosecuted even into the Spanish territory. A narrative of these two expeditions was published in 1810, which although rich in geographical and other valuable information, is comparatively barren in its notices of the Botany and natural history of the unknown regions through which he passed; no one conversant with these subjects having been associated with him. This we have the greater reason to regret, because we know that one gentleman at least, of pre-eminent attainments, applied to the executive for permission to accompany these expeditions, but applied in vain.

A few years after the return of the party under Lewis and Clark, the same country which they explored was visited as far up as the Mandan Villages on the Missouri, by Mr John Bradbury, an English gentleman of very respectable attainments as a naturalist, who had been sent to America, by an association in England, as a collector of objects in natural history, and of seeds and roots, for introduction to the gardens of that country. Descending the Ohio from the East, he examined the productions of its borders; and at St Louis, where he remained during the entire season of 1810, he diligently explored the region round about, and despatched in the fall a rich collection of plants to Europe. Early in the spring of 1811, he joined a fur-trading company and ascended with them the Missouri to the point we have mentioned. On this voyage, still larger collections, and some new discoveries were made, which being sent to England fell into the hands of Pursh, and were published in his Flora, as it appears, without the consent of Mr Bradbury. In 1817, this traveller published in London a jour-

nal of his travels in America during the years 1809-10-11, in which is contained a great deal of interesting information, on the Botany of the Missouri country.

It is now time that we notice more particularly a work, whose publication forms a considerable epoch in the annals of American Botany, and whose author on several occasions we have already mentioned.

Frederick Pursh, a German by birth, and educated at Dresden, left that country in 1799, with the determination, as he states, not to return, until he had explored North America to the utmost of his means and abilities. From the time of his arrival until the year 1811, when he returned to Europe, he seems to have been variously engaged, and at different points of the Eastern and Southern States, in prosecuting his design; but his most extensive explorations were made during the years 1805 and 1806, in one of which he visited and examined the Northern States, and in the other, the Southern from New Hampshire to Georgia.

"Both of these tours," as he says in the preface to his work, "I made principally on foot, the most appropriate way for attentive observation, particularly in mountainous countries; travelling over an extent of more than three thousand miles each season, with no other companions than my dog and gun, frequently taking up my lodgings in the midst of wild mountains and impenetrable forests, far remote from the habitations of men." It does not appear, however, that Pursh ever crossed the Alleghanies or descended into the Western Valley; consequently in the present inquiry we would not be so much interested in tracing his footsteps, or noticing his labours, except that they resulted in the publication of a work, by far the most comprehensive which has ever yet appeared on the subject of American Botany.

In 1811, after an absence of twelve years, Pursh returned to Europe with an ample stock of materials towards a Flora of North America, which, in 1814, he published in London, under the title *Flora Americæ Septentrionalis*. In the compilation of this work he seems to have availed himself industri-

ously of the aids furnished him in that great emporium of all science, the British capital, and particularly in referring to the extensive Herbaria there collected of American plants.

In this work of Pursh, frequent references are made to Western plants and Western localities; but for all such he must have been indebted to the Michauxs, Nuttall, Bradbury, Menzies, Lyon, Lewis, and other explorers of Western America; of the labours of all of whom he appears to have freely availed himself in enriching his work, and too often, as I am constrained to believe, without making the proper acknowledgments. Nevertheless, whatever may be the minor inaccuracies of this work, or the reprehensible mode in which some of its materials may have been collected, it must be confessed that it was, and indeed still continues to be, the most complete and extensive Flora ever yet published of our country.

About the year 1815, this country was visited by the Abbè Correa de Serra, a man of distinguished attainments in natural science, as well as general literature, whom Jeffrey, the former well known editor of the *Edinburgh Review*, calls "the learned Portuguese." On his return to Philadelphia, where he then resided, Mr Correa spoke to us in rapturous terms of the Botany of our native State, Kentucky; and especially of his astonishment at finding in our mountains an arborescent *Andromeda*, having never before seen any other than shrubby species. We are not aware, however, that this gentleman ever published any thing on the natural history of this region, except a paper in the Transactions of the American Philosophical Society, more particularly on the Geology of the West.

We come in the next place to notice the labours of an individual, much more immediately identified with the interests and advancement of Western Botany than any of those who had preceded him. I allude of course to Mr Thomas Nuttall, whom we have already mentioned more than once. An Englishman by birth, he was at an early age thrown on our shores, where he soon became enraptured with its natural productions, and has since devoted his life exclusively to their

investigation. In 1811, he accompanied Bradbury on his then perilous voyage up the Missouri; soon afterwards he travelled extensively in the Arkansas territory—then an unknown region. In 1816, we had the pleasure of meeting with this gentleman in this country, and enjoyed the happiness of making with him several herborizations, in the neighbourhood of this place and Cincinnati. At that time, in addition to his zeal for botanical acquisitions, he was much interested in the examination of the aboriginal relics of this region, and we assisted him in taking plans and measurements of an extensive fortification at the confluence of the great Miami and Ohio rivers, and of another in this vicinity.

In 1818, this Botanist published his *Genera of North American Plants*, the result of personal collections and observations made during nine years active research, throughout most of the States and Territories of the union; during which time he more than once visited the Western section of it. Though differing essentially in character and scope from the works of Michaux and Pursh, since it professes only to give generic characters, together with a mere catalogue of species, and detailed descriptions of such only as are new, yet the Genera of Nuttall is not a less useful or excellent production than either of the former; whilst in point of accuracy and minuteness, it is even more so. The testimony of the public to this assertion is manifested in the fact, that a second edition of it has been long demanded.

By this work the American Flora has been enriched with many acquisitions of interest, utility, and beauty, made by its author in every portion of the Union. Time would fail me were I to attempt an enumeration of them, but I cannot pass them by without a notice of a few of those—the more exclusive natives of our Western woods. Among these are the early flowering *Erigenia bulbosa* the first harbinger of our spring—the beautiful parti-coloured *Collinsia verna*, dedicated to his friend and fellow-botanist, Zaccheus Collins of Philadelphia—the *Phalangium esculentum*, as ornamental as the cultivated Hyacinth, and having a large edible and nutritious

bulb—the gay and graceful *Hesperis pinnatifida*—the Osage apple or orange of Arkansas, most appropriately named in honour of William Maclure, the American patron of the Natural Sciences, &c. Of late, Mr Nuttall's predilections seem to run chiefly in the line of ornithology, on which he has published in Boston two volumes, illustrated with very neat woodcuts of many of the birds of America. Recently, however, he has given to the public two lengthy papers on the subject of American Botany, one in the Transactions of the American Philosophical Society, entitled "Contributions towards a Flora of Arkansas," containing descriptions of the plants, which he had detected in his travels through that territory; the other, "Notices of new and rare species from various parts of the American Union."

The lovers of Natural Science will be gratified to learn that Mr Nuttall is now engaged in making further explorations of the Rocky mountains, the river Oregon, and the contiguous islands of the Pacific Ocean; from which, in addition to his already well-earned reputation, he will doubtless acquire a distinguished character, as an enterprising naturalist.

The order of our inquiry next leads us to notice the labours of another expedition of discovery sent by the general Government to the Rocky mountains, by way of the Platte branch of the Missouri, and thence homeward by the Arkansas river. This expedition, under the command of Major Long, had attached to it several gentlemen eminently qualified to observe, collect, and report on the natural productions of the interesting and unknown regions through which they passed. These were Drs Baldwin and James, Messrs Say, Peale and Jessup, the botanical investigations being particularly intrusted to the two former. This party left Pittsburgh in May, 1819, and in October of the following year, assembled at Cape Gerardean, on the Mississippi, where it was dispersed.

At Franklin, on their outward journey, this party was deprived of the professional and scientific services of Dr Baldwin, by the lamented death of that gentleman, whose ardour in the pursuit of botanical knowledge, led him to

undertake an expedition to which his declining health was totally inadequate; and on the banks of the Missouri, far from the bosom of his family, and the circle of his friends, he found an untimely grave.* "His Diary, in which the latest date is only a few days previous to his death, shows with what earnestness, even in the last stage of weakness and disease, his mind was devoted to the pursuit, in which he had so nobly spent the most important part of his life. He has left behind him a name which will long be honoured; his early death will be regretted, not only by those who knew his value as a friend, but by all the lovers of that fascinating science, to which his life was dedicated, and which his labours have so much contributed to advance and embellish."† His Herbarium and communications, it is well known, have contributed to enrich the works of Pursh and Nuttall. He was the friend and correspondent of Muhlenberg and Elliott, and contributed materials for the copious catalogue of the former, and the excellent "Sketch," of the latter. In South America, where he had travelled extensively, he met with Bonpland, the celebrated companion of Humboldt, and a friendly correspondence was there established between them which continued until his death. His notes and collections made during frequent journeys through Georgia, Florida, and other parts of North America, are extensive and valuable. During the short period of his connexion with Long's expedition, the infirmities resulting from a long established and incurable pulmonary disease, then rapidly approaching its fatal termination, could not overcome the activity of his mind, nor divert his attention from his favourite pursuit. Though unable to walk on shore, he caused plants to be collected and brought on board the boat; and not disheartened by the many vexations attending this method of examination, he persevered throughout the course of the voyage from Pittsburgh to Franklin, detected and

* Dedication of the *Florula Cestrica*, by William Darlington, M.D.

† Account of the Expedition, by Dr James, Phila., 1823.

described many new plants, and added many valuable observations relating to such as were before known.*

After the death of Dr Baldwin, the botanical duties of the expedition devolved upon his successor Dr James, who discharged them in a highly satisfactory manner, as will appear from a reference to an account of the expedition, drawn up by himself, and published in two volumes 8vo., in 1823. In this work will be found a vast amount of general information in regard to the countries explored, and especially on the subject of its vegetable productions. Previously to the appearance of this work, however, the botanical results of the expedition were given by Dr James in the 2d volume, (N. S.) of the *Amer. Philos. Trans.*; and more recently a fuller account of the plants found exclusively on the Western side of the Mississippi, has been published by Professor Torrey in the Annals of the Lyceum of Natural History, of New York.

Within a short time past, death has robbed the republic of science of another member of this expedition—another naturalist of pre-eminent attainments—Mr Thomas Say. This gentleman, whose acquirements in some of the most difficult departments of Natural History were perhaps superior to those of any other individual on the Continent, published some years since, three volumes on American Entomology, which in point of elegance of execution, and accuracy of matter, will challenge a comparison with any similar production. For the last few years Mr Say had resided at New Harmony, Indiana, whither he had been invited by his friend, the proprietor, Mr William Maclure. Here he undertook the publication, periodically, of a work on the shells of North America, illustrated with coloured engravings from the pencil of his accomplished lady. This work, which is highly spoken of by those best conversant with the subject of which it treats, is the first work on any department of Natural History which has yet been published in the

* Account of the Expedition, &c.

Mississippi Valley, and constitutes, therefore, a memorable epoch in the annals of Western Science. We proceed, however, with the investigation now immediately before us—the progress of botanical discovery.

The British government having failed to effect the long cherished object of discovering a North-Western passage by sea to the Pacific ocean, although successive naval expeditions, liberally outfitted and ably conducted by Captains Ross, Parry, Lyon, and Beechey, had each made most energetic and daring efforts to accomplish it, determined upon other plans of exploration, by which this long-sought and anxiously desired channel might still be found.

Among these none seemed so feasible, or so full of promise, as that of sending an expedition *over-land* from Hudson's Bay to the Arctic Ocean, and the investigation of its coast quite across the Continent. With this view two several expeditions under the command of Capt. Sir John Franklin, of the Royal Navy, were successively despatched on this new and venturous project. And although they also failed to effect the main object of government, yet as they contributed greatly towards a knowledge of the Natural History, and especially the Botany and Zoology of the Arctic and North Western portions of our continent, a brief notice of each will not be deemed irrelevant to the inquiry before us.

The first of these *over-land expeditions*, under the command of Capt. Franklin, accompanied by Dr John Richardson, as surgeon and naturalist, disembarked at York Factory on Hudson's Bay, in August, 1819; and notwithstanding the long detention, occasioned by an intervening winter of nine months' duration, by the end of the second season they had penetrated northward to the Polar Sea. Here winter, arrayed in all the horrors of an arctic climate, overtook the party early in September. They suffered dreadfully from cold and famine, to a degree indeed unparalleled in the annals of human misery; most of the party perished, and the survivors were on the verge of the grave, when the Indians

brought them supplies of provisions, and conducted them to the nearest post of the Hudson's Bay Company.

By this disaster all the extensive collections made on their outward journey were lost—the enterprise was abandoned, and in the summer of 1822 the small remnant of the party returned to Europe.

On the return of Capt. Franklin and Dr Richardson from an expedition where they had purchased so dearly the glories of discovery, it was not asked, nor even expected by their native country, that they should again brave the perils of those distant and terrible shores. Yet so high was the ardour with which they were inspired, that scarcely had they breathed from their voyage, before they presented a new scheme for completing the outline which they had only begun to sketch. The British government cordially embraced the proposal, and furnished most liberally every means of prosecuting the undertaking with success, and escaping the evils which had before pressed on them so heavily. Three large boats were constructed of mahogany, so light that they could be carried on men's shoulders across the portages, yet so firmly knit together that they were able to face the waves of the northern ocean. Provision was laid in (consisting chiefly of pemmican, a light, portable, and highly nutritious article), calculated for two years subsistence; and the boats being sent forward by the way of Hudson's Bay, the officers took the more agreeable route of New York.

In the spring of 1825, Franklin and Richardson, accompanied by Mr Thomas Drummond, as assistant naturalist, proceeded from New York along the chain of inland seas from Ontario to Lake Winnipeg, where meeting with their boats and the rest of the detachment, they proceeded northward until they fell on the Mackenzie river, and embarking on its waters, reached in due time the Polar Sea; the shores of which, through more than forty degrees, and under the 70th of latitude, were diligently explored during the brief interval of one arctic summer.

In the progress of this expedition, Mr Drummond visited

the Rocky Mountains, by the route of the Saskatchawan river, and reached them at that interesting and important point which must be considered as the most elevated of that lofty chain, for here the *four mightiest rivers of the continent, interlocking their primary rills, descend in the four cardinal directions, seeking their different and far distant ocean-homes* —the Saskatchawan runs eastward to Hudson's Bay—the Mackenzie northward to the Polar Sea—the Columbia westward to the Pacific Ocean,—and the Missouri southward to the Gulf of Mexico; whilst in the same quarter, though comparatively in a much lower region, arise the St Lawrence and the Mississippi proper.

From the most elevated portion of the Rocky Mountain chain, at this interesting point, rise, in towering majesty, two rival peaks to the height of fifteen and sixteen thousand feet, between which a passage of comparatively easy ascent is offered across the mountains. These guardian giants of the pass are named in honour of two illustrious botanists of Great Britain—Brown and Hooker; and thus are the Pelion and the Ossa of the Rocky Mountains—those Chimborazos of the northern Andes, dedicated to the cause of Botany; and whilst they rear their towering summits to the skies, clad in eternal snows, they proclaim the pure and elevated delights of our science, and stand themselves everlasting monuments of the zeal and daring of its votaries!

Whilst this portion of British America was thus diligently explored by this party, that section of it lying west of the Rocky Mountains, on the Pacific coast, and contiguous to the Columbia river, was undergoing a similar investigation by Mr David Douglas, a very competent Botanist, who was sent out by the London Horticultural Society.* Thus a zone of at least two degrees of latitude in width, and reach-

* The fate of the indefatigable and lamented Douglas, was melancholy in the extreme. From the American coast he passed over to the Sandwich Islands; and whilst exploring one of these, he fell into a pit, prepared by the natives for entrapping the wild-bull, and by one of these animals was gored to death!

ing entirely across the continent, from the mouth of the Columbia to Hudson's Bay, has been explored by three of the ablest and most zealous collectors that England has ever sent forth; while a zone of similar width, extending at right angles with the other, from Canada to the Polar Sea, has been more cursorily examined by these expeditions.

The botanical results of these labours are now publishing in London, under the title of *Flora Boreali-Americana*, by that able and distinguished Naturalist, Sir William J. Hooker. The British Government, actuated by a most laudable desire of encouraging our science, has lent a liberal aid to the undertaking, and has granted one thousand pounds to be applied towards defraying the expense of the engravings alone. About one half of this splendid work has reached us, and when completed, it will be an invaluable acquisition to the American botanist.* It will, indeed, identify the names of Douglas and Drummond, of Richardson and Hooker, with the cause and progress of Western American Botany.

The order of our inquiry next leads us to notice the further labours of one of the naturalists of this expedition, in a different quarter of the Continent. Having published in England, a work exclusively on the subject of the American Mosses, chiefly the result of his late researches, in 1825–6–7, Mr Drummond again sailed for America, at the instance, and through the liberal pecuniary aid chiefly of Sir W. J. Hooker and Dr Graham, for the purpose of exploring the less known parts of the Southern and Western United States. Commencing his tour again at New York, in the spring of 1831, he passed through Philadelphia and Washington, where every facility was afforded him by naturalists and official agents, for a successful prosecution of his undertaking. He crossed the Alleghanies on foot, descended the Ohio from Wheeling to its mouth, and thence up the Mississippi to St Louis. Here, and in the neighbourhood, he remained

* The *Flora Boreali-Americana* was finished early in this year (1840), and constitutes two 4to volumes, illustrated by 240 plates.—Ed.

until the winter, and although his labours were greatly interrupted by an attack of fever and consequent bad health, he made very extensive collections of plants, shells, and Zoological specimens.

During the following spring and summer, Mr Drummond explored the neighbourhood of New Orleans with his accustomed zeal, and thrice examined the opposite shore of Lake Ponchatrain. From this he extended his travels into the neighbouring Southern States, where amidst many dangers, and notwithstanding the severest attacks of fever and cholera, he amassed a collection of one thousand species of plants.

Mr Drummond next visited Texas, from the floral riches of which *El Dorado* of the botanist, he promised himself a rich reward, nor was he disappointed. For although his visit to that country was ill-timed, in consequence of the unprecedented wetness of the season (1833–4), its consequent unhealthiness, and the unsettled position of its political affairs; still he made very extensive collections, among which were many new and beautiful plants. Of these, a number have been introduced to the gardens of Great Britain, and several have been figured and described in *The Botanical Magazine;* whilst in the *Companion* to that work a general account has been given of the labours of Mr Drummond in the Southern and Western States, by his friend and patron Sir William Hooker.

It appears from some of his last letters to his friends in Scotland, that Mr Drummond had determined upon a permanent settlement in Texas; and to this end had made arrangements for returning home to remove his family. Desirous, however, of still further extending his knowledge, and increasing his collections, he touched at Havana on his way homeward: he was there soon seized with fever, of which he died, in the fall of 1834. Deeply has science to deplore the martyrdom of this intrepid traveller and indefatigable collector: had he lived, much would doubtless have been effected by him, in making known the vegetable trea-

sures of his adopted country; and few have done more for the botany of Western America than Thomas Drummond.

About this time our Western borders were visited by another foreign naturalist, Prince Maximilian de Neuweid, who having spent some time in the Eastern States and in Pittsburgh, determined to visit the upper Missouri, and to extend his tour to the Rocky Mountains. The hostility of the Indian tribes prevented him from realizing his original plan to the full extent; nevertheless, he ascended some distance beyond the confines of civilization, and obtained a very fine collection of plants and animals; and what is also a matter of much interest considering how fast the native sons of our forests are being exterminated, he made a series of drawings of some of the most distinguished chiefs and warriors belonging to about twenty different tribes, who are as yet but imperfectly known to the whites.

Next in chronological order, we come to make mention of Mr Charles Beyrich, a Prussian gentleman of science, who, under the auspices of that government, visited America about four years since, passing the greater portion of that time in the diligent exploration of its botanical treasures. He spent the summer of 1833 chiefly in the Carolinas and Georgia, where, and in some of the adjoining States, he amassed a collection of thirteen hundred species in one season. Visiting the city of Washington during the succeeding winter, and learning that a military expedition would be sent the ensuing spring, into the Indian territory west of the Mississippi, he applied for, and readily obtained permission from Secretary Cass to accompany it. He joined the detachment at St Louis in the spring, proceeded with it to the different frontier posts, and was with the U. S. Dragoons in their engagements with the Pawnees and Cumanches. On the return from this journey, richly laden with the fruits of extensive and diligent observation and with collections from a new and unknown region, he was seized with cholera, and died at Fort Gibson, in September, 1834. Mr Beyrich is represented by those who knew him to have been an

amiable, liberal, communicative and unpretending man, and a profound botanist.—Science will long and deeply deplore his untimely end!

Last in our notice of foreign labourers in the field of Western Botany, we must mention Dr Joseph Frank of Germany, who after having made extensive explorations and collections in his own country and Switzerland, came over to America with the same object in view. He spent a year or two in Cincinnati, and other parts of Ohio; when he was commissioned by the Grand Duke of Baden to travel in the Southern and Western States. On this service he ventured to New Orleans early in the fall of 1835, where he speedily fell a victim to yellow fever. What was the extent of his collections in this country, or what disposition has been made of them, we are uninformed.

Whilst these researches were in progress towards the elucidation of the botany of the West, by travellers from abroad, and investigators from other portions of the Union, a few of our own citizens were not entirely inattentive to, or unobservant of it. Among these, Dr Daniel Drake was foremost. In *A Natural and Statistical View or Picture of Cincinnati and the Miami country*, which he published in 1815, a very copious catalogue is given of the forest trees found in that quarter; and another of such herbaceous plants as are useful in Medicine or the Arts; to these is appended a Floral Calendar, or Journal of the progress of vegetation in and about Cincinnati. During his subsequent engagements as Professor of Materia Medica in Transylvania University, he devoted a due share of attention to medical botany, and both in his lectures and writings he has ever strenuously advocated the cause of botany, as an important collateral branch of the science of medicine.

In 1819, a work of somewhat a similar character to that just mentioned, was published by Dr M'Murtrie of Louisville, in which, among a variety of other matter, is given a catalogue of the plants growing in the neighbourhood of that city. We cannot, however, vouch for the accuracy of

that catalogue; though the locality is confessedly a rich one, a number of the species mentioned by Dr M., have never been found there by succeeding botanists.

From about this time to 1826, Lexington was the residence of Mr C. S. Rafinesque, who held for some portion of that time, if we mistake not, the professorship of modern languages in its University. This gentleman, in the general scope of his survey of all the natural sciences, paid much attention to botany; and during his frequent and prolonged excursions through various portions of Kentucky, and the adjoining States, he formed large collections of animals, shells, plants, minerals and organic remains. It is to be regretted, however, that his discoveries, of which he professes to have made many—very many—in each of these departments, have been published either in foreign journals or ephemeral magazines, so as to be lost, or rendered inaccessible to the majority of readers; and consequently they are of little or no use to the students of our country.

From this hasty and very imperfect sketch of the labours of our predecessors and contemporaries, we come next to mention the humble efforts of ourselves and a few friends in this immediate field. For the last twenty years we have paid some attention to the botany of Kentucky, and whilst actively engaged in the practice of medicine, in that portion of the State most inaptly called "The Barrens," opportunities were constantly presented for admiring and noting the varied vegetable productions of that interesting region. In many a long and solitary ride through these natural flower-gardens, have our fatigues been lightened, and our spirits cheered by their floral charms. Here at one point, the ground was carpeted with the flame-coloured flowers of the dazzling *Euchroma;* and there enamelled with the particoloured blossoms of *Violets, Gentians*, and *Trilliums.* In this spot, from amidst a tuft of humbler beauties, the majestic *Frasera* was seen shooting up its pyramidal head, crowned with wreaths of its very peculiar flowers; and in that, various *Sumachs* overhung the path, emitting from their clumps of

berries a shower of acid on the traveller. Now, would burst upon the view a smooth sheet of water, skirted with the blue and purple hues of the *Pontederia* and *Decodon*, intermixed with the scarlet berries of the *Prinos*, whilst its surface was covered over with the large and floating leaves and splendid flowers of the *Cyamus;* and then, in endless vista, was stretched before the eye a waving sea of gigantic grasses. In such a field as this, none but a recreant to nature and undeserving of her pleasures, could remain indifferent to the charms spread in such lavish profusion around; and, although we were not idle, inattentive or unobservant of them, yet do we now find cause for bitter regrets, that we did not then more industriously avail ourselves of the opportunities thus enjoyed, for studying, examining and collecting the productions of that rich and interesting region.

In our subsequent efforts in the cause of Western Botany, it has been our good fortune to be associated, at different times, with a few fellow-labourers, whose devotion and industry have contributed greatly to our perseverance. Of these, the late Mr Eaton must first be mentioned; whose amiability of character, and zeal in the pursuit of natural science, greatly endeared him to us, and gave an additional incentive to our own. That zeal in him, alas, but too soon lighted the fire which consumed him! for of our departed friend it may with much truth be said, that

"Science 'self destroyed her favourite son."

Having in another place* attempted an eulogy of this excellent young man, we will only here pause a moment to pay the passing tribute of a sigh to one so rarely endowed—so deservedly esteemed.

About the time of the death of Mr Eaton, his loss to the cause of science in the West was fortunately supplied by two individuals, one of whom had been his fellow-student in

* A Biographical Memoir of H. Halbert Eaton, A.M., late Assistant Professor of Chemistry in the Medical Department of Transylvania University.— *Transylvania Journal, Vol.* v.

the Rensselaer Institution, while in the other he had been instrumental in exciting a relish for the charms of botany—these were Dr Robert Peter, and Mr Henry A. Griswold. In connexion with one or both of these gentlemen, we have been diligently engaged, for the last five years, as leisure and opportunity permitted, in exploring various portions of Kentucky. Of those localities, which have been for the most part very thoroughly examined, and which have yielded us the richest harvests, may be mentioned the precipitous limestone cliffs of the Kentucky river at various points—the sandstone hills and swampy bottoms bordering the Licking river—the mountainous region round about the Olympian Springs, and the Blue Licks—the elevated point in Madison county called the "Big Hill"—the Knobs around the Crab Orchard, being the first spurs of the Cumberland mountains—the country bordering the Ohio river at Maysville, Cincinnati, North Bend, and especially the marshy track around Louisville—the Barrens of Kentucky, &c., &c. The results of these explorations have been published in the form of Catalogues of the Plants of Kentucky, in several preceding numbers of the Transylvania Journal of Medicine, from which it appears that about one thousand species have been detected by us, as natives of the State, which number will probably be extended by future examination to fifteen hundred. The fruits of these collections in the shape of well prepared specimens have been gladly distributed among our brother botanists; and within the time just specified not less than twenty-five thousand specimens of Western plants, have been forwarded by us to various correspondents in different portions of Europe and America. Nor have these offerings been unrequited. On the contrary we have great pleasure in acknowledging valuable and acceptable returns in exchange, from Sir William Hooker of Glasgow; Dr Greville of Edinburgh; Mr Bentham, of London; Mr Parker, of Liverpool; M. Mirbel, of Paris, and Dr Fischer, of St Petersburgh. Whilst our countrymen, Professor Torrey and Dr Gray of New York; Mr Oakes of Massachusetts, Dr Griffith and

Mr Durand of Philadelphia; Dr Darlington of Pennsylvania; Dr Aikin of Baltimore; Rev. Mr Curtis and Dr Loomis of North Carolina; Rev. Dr Bachman of Charleston; Dr Chapman and Mr Croom of Florida, have been prompt and liberal in exchanging specimens from their several districts with us.

By the addition of these contributions to our own collections, we have been enabled to form a very extensive Herbarium which is daily increasing; and thus are we becoming gradually possessed of materials and information, out of which we trust may be ultimately compiled a full and faithful Flora of Kentucky.

Nor is Kentucky, by any means, the only Western State in which resident botanists are actively engaged. In Ohio, on the contrary, the number of labourers is greater than with us. Among these, Dr Riddell has published quite a comprehensive Catalogue of Western Plants.* In Cincinnati, he is assisted by the co-operation of Drs Eberle, Locke, and Colby, and Messrs Buchanan, Lea and Clark; in Dayton, by Mr Vancleve; and in Worthington, by Mr Paddock. In Western Virginia we hear of Mr Townsend, at Wheeling; in Michigan, of Dr Houghton, at Detroit; and on the borders of Lake Michigan, in the new territory of Wisconsin, of Mr Lapham, at Milwauke, all engaged in bringing to the light of day the hidden treasures of their several districts. Of our South-Western States we regret not to be able to give a more favourable account; but we have not the pleasure of knowing personally, or by report, a single botanist, or collector of plants resident in Tennessee, Alabama, Mississippi, Arkansas or Missouri. What a wide, interesting, and almost exhaustless field for future discovery! In Louisiana, Dr Clarendon Peck has made some investigation into the plants of Sicily Island; and Drs Hale and Ingalls are respectively engaged on the Botany of the country

* A Synopsis of the Flora of the Western States. By John L. Riddell, M.D., &c., Cincinnati, 1835, pp. 116.

adjacent to Alexandria and New Orleans. Whilst the extreme limits of our frontier borders have been occasionally more or less attentively examined and explored by Drs Leavenworth and Pitcher, Surgeons in the U. S. army, as they have happened to be stationed at the different outposts. This list of labourers in the wide-spread field of Western Botany is far we trust from being complete—at all events, we hope it may be rapidly augmented by the addition of zealous devotees in all quarters, until the vegetable riches of this vast territory are fully ascertained!

In connexion with these desultory remarks on the progress of botany in Western America, it may not be irrelevant to observe, that some two or three years ago, at the instance of the Lexington Medical Society, we read before it a paper on the subject of collecting and preserving plants for herbaria, which, having been printed and extensively circulated, has received the commendation of those best qualified to judge of the matter; and we trust the directions therein given, will be found useful in diffusing a general knowledge of that important point in practical botany—the formation of perfect specimens.

In conclusion, we regret not to have been able to give, in the proper place, some account of the discoveries of Dr Scouler and M. Chamisso, on the Western coast of the Continent. The former of these gentlemen accompanied one of the British expeditions of discovery; and the latter was Naturalist to a Russian scientific voyage under Kotzebue.—Both have contributed valuable materials towards a Flora of the Pacific coast, but we are not sufficiently acquainted with the particulars of them to enter into any detail. The same may be said of two other botanists of our own country, Dr L. C. Beck, of New York, and Mr Schweinitz of Pennsylvania, both of whom have performed tours through Ohio, Illinois, and a part of Missouri, of which some notice has been published by the former in Silliman's Journal.

Lexington, Kentucky, *August*, 1836.

## XII.—*Observations on the Distinctive Characters of the* Papilionaceæ *and* Cæsalpinieæ, *Sub-orders of* Leguminosæ. By George Bentham, F.L.S.

My friend Dr Vogel, who has for some years past studied with great care the Order of *Leguminosæ*, and published several important memoirs on the subject, has communicated to me a paper on the plants of that Order collected by Meyer, in his voyage round the world.* To this paper he has prefixed some criticisms on the limits I had proposed to draw between the sub-Orders *Papilionaceæ* and *Cæsalpinieæ*, which have induced me to repeat some of the investigations I had gone into, and to give the matter further consideration, the results of which it is now my object to state.

Dr Vogel's remarks are founded on the opinions emitted in a memoir I prepared at Vienna in the commencement of the year 1837,† and on two short papers read before the Linnæan Society, one on the genus *Mora*, read March 20th, 1838;‡ the other on *Arachis* and *Voandzeia*, read May 1st, 1838.§ At the time I published these partial memoirs, I had examined but few *Cæsalpinieæ*, and although it even then appeared to me that the structure of the flower would furnish the best character, I had not formed a sufficiently definite notion of what really constitutes a papilionaceous corolla, to make use of it as a positive character, and had been led into

* From the Nov. Act. Acad. Cæs. Leop. Carol. Nat. Cur. v. xix. Suppl.

† Published in the Annalen des Weiner Museums der Naturgeschichte, v. xi. p. 63. *et seq.*

‡ Linnæan Transactions, v. xviii. p. 209.

§ Linnæan Transactions, v. xviii. p. 155. Neither Dr Vogel nor Dr Walpers appears to have read this paper through when they quote it, for the former says that I refer in it, *Arachis* and *Voandzeia* to *Hedysareæ*, and Dr Walpers (Linnæa v. xiii. p. 531) quotes it as his authority for placing *Voandzeiæ* among *Hedysareæ*, when one distinct object of the paper was to show, that these two genera were but slightly related, and that while *Arachis* should be placed among *Hedysareæ*, *Voandzeia* belongs to *Phaseoleæ*.

some errors, especially in regard to *Cercis*, which I considered as papilionaceous, which it certainly is not. I have since had occasion to examine some species of above sixty Cæsalpinieous genera, more especially with reference to the structure of the flower, and to the diversity of æstivation adverted to by Vogel in the *Linnæa* (*v.* xi. *p.* 381), and the conclusions I have been induced to come to are stated in my paper on Schomburgk's *Leguminosæ* (*Vol.* ii. *p.* 69, *et seq. of the Journal of Botany*), I have there given a primary importance to the æstivation of the corolla, and considered the form of the embryo as a more secondary character; an opinion which appears once to have been that of Dr Vogel also, but he now thinks that the most absolute value should be given to the character derived from the curved or straight embryo, to be determined in cases of doubt by the curvature or straightness of the ovule (*i. e.* of the nucleus;) an opinion to which I confess I see less reason to subscribe, the more I examine into it.

It will, I believe, be generally agreed, that the essential character of the great mass of *Papilionaceæ*, is to have a corolla papilionaceous in its æstivation (that is to say, the posterior petal overlaps the two lateral ones, and these in their turn overlap the two anterior or carinal petals), combined with a decidedly curved embryo, the radicle being usually conspicuously curved down on the edge of the cotyledons and directed towards the hilum; and that the greater number of *Cæsalpinieæ* have an apparently straight embryo, with a corolla either *carinal* (*i. e.* with the anterior petals outside,) in its æstivation, or more or less irregularly imbricate. The difficulty lies in those cases where these characters do not go together, and especially in those genera, now rather numerous, where the papilionaceous æstivation is combined with a straight embryo.

These genera, such of them at least as have come under my observation, may be considered as forming four different groups, corresponding to four of the recognised tribes of *Papilionaceæ* as follows:—

1. *Arachis*, which I have endeavoured in a paper quoted

above, to prove the affinity of to *Stylosanthes* among *Hedysareæ*, an affinity recognised by Bennett,* and by Torrey and Gray† who have further confirmed it by the addition of their new genus *Chapmannia*. This affinity appears to me to consist not only in the "corollæ structura *Stylosanthis* simili," but in the remarkable structure and physiological development of the sterile and fertile flowers in all their parts, and in the pod as well as in habit. Vogel says indeed, "quæ vero similitudo Hedysareum characterem non attinet, sed in quavis tribu occurrere potest, ita ut hanc causam non agnoscam," but he does not point out any instance, nor has it been my lot to observe a single example of similar flowers in any other tribe of *Leguminosæ*.

2. *Brongniartia* (including *Peraltea*) and *Harpolyce*, which to my eyes bear a much closer affinity to several *Galegeæ*, than to any genus of *Cæsalpinieæ*, excepting in the single character of the embryo.

3. *Geoffroya* and *Andira*, *Dipteryx* and *Pterodon*, *Cyclolobium*, and perhaps some others among my *Dalbergieæ*, where it appears to me that their nearest allies are to be met with.

4. A considerable number of genera with stamens free or nearly so, the flowers papilionaceous in æstivation, but sometimes rosaceous in expansion, the habit and inflorescence generally that of *Dalbergieæ*, or of some *Galegeæ*, and not unlike that of a few *Cæsalpinieæ*, which I had collected under the name of *Sophoreæ*, and placed at the end of *Papilionaceæ*, as forming an approach to *Cæsalpinieæ*. As my greatest doubts have always been in relation to some of these genera, it is to them I have more especially directed my attention on this occasion.

In order to ascertain what practical advantage may be gained by the examination of the ovulum rather than of the ripe embryo, I selected for comparison five species, of which I happened to have abundance of flowers in various stages, and in a good state for dissection, and also ripe seeds, viz.,

* Plantæ Javanicæ Rariores, p. 152.

† Flora of North America, v. i. p. 354.

*Sophora tomentosa, Calpurnia sylvatica, Bowdichia virgilioides,* (from Salzmann's Bahia specimens which I take to be the same as Kunth's species), *Cercis siliquastrum*, and *Cæsalpinieæ pulcherrimæ.*

1. *Sophora tomentosa.* This genus, the type of the *Sophoreæ*, has by all botanists been classed amongst *Papilionaceæ*. As at present constituted it is not a very natural one, some species (*S. alopecuroides*,) having considerable affinity to *Galegeæ* or *Astragaleæ*, others to *Dalbergieæ* (*S. heptaphylla*), and some of the Chilian ones approaching *Edwardsia* in many points, but all connected together chiefly by the pod. In the species now examined, the ovule is nearly reniform, and the nucleus very evidently curved; as the seed ripens, the cotyledons enlarge and thicken very much, and the embryo becomes almost straight with an exceedingly short radicle. In some other species the ripe embryo is much curved, with a hooked radicle; but in others again it is nearly as straight as in *S. tomentosa.*

2. *Calpurnia sylvatica*, belonging also to a genus universally admitted to belong to the Papilionaceous class. Here I find an obovoid ovule with the nucleus as nearly straight as in the generality of *Cæsalpinieæ*. The ripe embryo is also straight, which is the more apparent as the radicle is remarkably long. The hilum in the ripe seed is indeed much indented, but this indenture is opposite the narrow base of the cotyledons, and occasions no perceptible curvature of the embryo. Of another species, *C. intrusa* (of which I have no ripe seeds), Vogel says, "jam radiculam semper curvatam video." The genus is a much more natural one than *Sophora.*

3. *Bowdichia virgilioides*, classed by De Candolle as well as by Vogel among *Cæsalpinieæ*, but on account of the flowers referred by me to *Sophoreæ* among *Papilionaceæ*. The ovule is much shorter than in *Calpurnia sylvatica*, the nucleus is more perceptibly curved, but is still what is usually called straight. In the ripe embryo the radicle is very short, but the central line down the cotyledons to the tip of the radicle

is a slight curve. Of another species Vogel observes, "video .... embryonem semper rectum .... in *Bowdichia* (saltem *majore*), sed fortasse in hoc genere quod in affini *Leptolobio* accidit, formam embryonis incertam esse."

4. *Cercis siliquastrum*, considered by all as a true Cæsalpinieous plant. I had indeed as above mentioned once included it among *Sophoreæ*, but that was from a mistaken notion of what constitutes a papilionaceous corolla. The æstivation of *Cercis* is essentially carinal. The ovule is about the shape of that of *Calpurnia sylvatica*, but the nucleus is most remarkably curved, the extremity next the foramen being hooked as in the common *Papilionaceæ*, and much more so than in *Sophora tomentosa*. Indeed the ovule of *Cercis* was the first instance given by Mirbel of what he called *amphitropous* ovules, from their being curved as in campylotropous ones, but with a raphe as in anatropous ones. The ripe embryo is however as straight as in any leguminous seed I have seen, and Vogel also considers it as an orthoblast, "video in *Cercide* embryonem semper rectum," an instance in direct contradiction to what is asserted in the preceding page: "Hoc ovuli curvamen, in nostra quidem familia, etiam embryonem curvatum efficit, et hic plerumque etiam radiculam curvatam."

5. *Cæsalpinia pulcherrima*, or *Poinciana pulcherrima* of most authors, which may be considered as one of the types of *Cæsalpinieæ*, of which it has all the requisites. The ovule is very broad, the raphe exceedingly thick, the nucleus straight to near the end next the foramen, where it is shortly but very evidently curved.* In the ripe seed the cotyledons are broad, straight, and deeply, but equally, heart-shaped at the base; the radicle is rather long, and in a line with the centre of the cotyledon, although even here a very close examination will show a slight degree of curvature towards the hilum.

Amongst several other species of my *Sophoreæ* with straight embryos, of which I have examined the ovules, I find a con-

* I find the same kind of ovule in some other species of the genus.

siderable degree of uncertainty in the curvature of the nucleus, farther instances of which it would be superfluous to particularize at present. I would only add that the ripe seeds of the common *Ormosia* from Rio Janeiro, (*O. nitida*, Vogel,) exhibit a curious anomaly which has not yet occurred to me in any other genus of the Order. The cotyledons are laterally compressed, their faces being at right angles to the valves of the pod instead of parallel to them, as in other *Leguminosæ*, the radicle is exceedingly short and straight, and the hilum, slightly indented, produces a corresponding slight indenture in the back of one of the cotyledons.

Supposing that I have not materially erred in the foregoing statements, it will be necessary, in making use of the data they furnish for testing the characters upon which the first subdivisions of Leguminosæ may be established, to bear in mind, that the same principles which regulate the formation of the natural orders themselves should be followed up in their subdivisions into tribes and genera; and especially that purely artificial distinctions derived from a single character should be avoided when they break up natural affinities. Upon this principle it is that De Candolle placed *Adesmia* amongst *Hedysareæ*, notwithstanding the free stamina, and that Brown left *Parkia* among *Mimoseæ*, though the æstivation of the corolla be imbricated.

An exception however is generally made, and often with reason, in favour of the form of the embryo, on account of its supposed physiological importance; but that importance, in this instance, appears to me to have been much overrated. The ovule in all *Leguminosæ* is essentially anatropous, that is to say, the chalaza is separated from the hilum by a raphe of greater or less length, but always very evident, and the foramen is brought down to near the hilum; there is moreover in almost all the species I have examined, at some stage of its growth, some tendency to a curvature of the nucleus, the distance from the chalaza to the foramen being shorter on the side next the hilum than on the other side; the difference between what is usually called the anatropous ovule and the hemitro-

pous ovule* in Leguminosæ being but one of degree. The curvature in the so-called Orthoblastæ is often imperceptible without a very nice examination, but at other times quite evident. In *Sophora*, *Edwardsia*, and some others of my Sophoreæ, it is more apparent, (though often very much less than in *Cercis*), and offers almost every shade from the orthoblastæ to the cyrtoblastæ. In the great mass of Papilionaceæ it is most decided. I do not deny, that to a certain extent, this difference coincides with others in the structure of the flower; and so far it is important, but I cannot consider it sufficiently positive to warrant the making it absolute in preference to all others.

Taking therefore the form of the embryo only as a character for the *natural* division of the Leguminosæ, we shall find that it will oblige us, 1st, to separate *Arachis* from some species at least of *Stylosanthes*, and place it in a class where there is no genus near it; 2d, to remove the *Brongniartieæ* far away from the only genera that have any affinity with them in flower or vegetative characters, to place them also as an isolated tribe amongst those which they resemble in nothing but the fruit; 3d, to remove *Cyclolobium* far away from *Amerimnum*, *Andira* from *Pterocarpus*, and probably break up, in other respects, the tribe of *Dalbergieæ*, to form a third papilionaceous tribe among *Cæsalpinieæ*; 4th, to break up or consider as ambiguous the genera *Sophora*, *Calpurnia*, *Bowdichia*, *Leptolobium*, and probably many others; 5th, to isolate *Ormosia* in a tribe by itself; and if the curvature of the embryo be tested as proposed by that of the nucleus, to break up several of those genera hitherto considered as undoubted *Cæsalpinieæ*.

On the other hand, if, as originally proposed by Vogel,† the preference be given to the æstivation of the corolla as the

* See a very interesting paper on the development of the flower in Leguminosæ by Schleiden and Vogel in the Nova Acta. Acad. Nat. Cur. v. xix. p. 1.

† Linnæa, vol. xi. p. 381, quoted above.

distinctive character,* it does not appear to me to be necessary to break up any really natural group. In all those cases where the general distinction between *Papilionaceæ* and *Cæsalpinieæ* is most decided, this character also is the most evident; and although many *Sophoreæ* on the one hand, and several *Leptolobieæ* on the other, approach mutually to each other in point of æstivation, these two tribes are also evidently allied to each other in many other points. The only genus, where the æstivation has been hitherto observed to be really variable or doubtful, is *Leptolobium* itself, which may be considered in many respects as a connecting link between the two sub-orders, besides that it is scarcely yet sufficiently known to be assured that it is in fact a natural genus.

There is another secondary point of view in which a character should also be considered, when relied upon for the separation of large groups of plants, that is, its artificial merit in assisting us in their practical arrangement; and for this purpose, two great requisites are, freedom from ambiguity, and facility of observation. The undue importance formerly attached to easy and artificial characters appears, of late years, to have induced some botanists to run into the opposite extreme, and almost to prefer minute and difficult ones; but surely, when two characters are equally natural, a preference should be given to the most evident and consequently the most useful; and here, it does appear to me, that the æstivation is at once the most natural and the easiest to ascertain. Few indeed, if any, are the cases where the opening of the bud will not at once give decided evidence of the æstivation of the petals; but among the embryos of *Sophoreæ*, *Dalbergieæ* and *Cæsalpinieæ*, there are numberless species where it would be difficult to say, whether the curvature is or is not sufficient to distinguish them from Orthoblastæ.

The following are the characters by which I would distinguish the three great divisions of Leguminosæ:—

* I reckon any aberration from the papilionaceous æstivation as non-papilionaceous.

Sub-Order I. *Papilionaceæ.* Corolla æstivatione papilionaceo-imbricativa ; petalo nempe postico (vexillo) exteriore, lateralibus (alis) intermediis, anticis (carina) intimis.—Calyx sæpius ultra medium gamosepalus. Stamina 10, fertilia, v. nonnulla rarius abortientia, circa ovarium approximata v. sæpius connata in tubum integrum v. postice fissum postico tunc sæpe libero. Seminum embryo sæpius curvatus. Folia nunquam bipinnata.

To this Sub-Order belong the Tribes—I. Podalyrieæ. II. Loteæ. III. Vicieæ. IV. Hedysareæ. V. Phaseoleæ. VI. Dalbergieæ. VII. Sophoreæ.

Sub-Order. II. *Cæsalpinieæ.* Corolla æstivatione irregulariter imbricativa nec papilionacea, sæpius carinali petalis anticis exterioribus postico intimo, interdum alari petalis lateralibus exterioribus, v. petalis plerisque se invicem uno latere incumbentibus.—Calyx varius sæpe ad basin fissus. Stamina sæpe asymmetrica v. valde inequalia, nunc numerosissima, nunc fere omnia abortientia rarius regularia, sæpissime libera v. basi tantum breviter connata. Seminum embryo sæpius rectus. Folia varia, sæpe bipinnata.

Tribes I. Leptolobieæ. II. Eucæsalpinieæ. III. Cassieæ. IV. Swartzieæ. V. Amherstieæ. VI. Bauhinieæ. VII. Cynometrieæ. VIII. Dimorphandreæ.

Sub-Order III. *Mimoseæ.* Corolla æstivatione valvata, rarissime apice imbricativa, petalis tunc in tubum longe coalita.—Flores subregulares. Stamina nunc symmetrica definita, nunc indefinita, sæpe numerosissima. Seminum embryo subrectus.—Folia sæpius bipinnata.

Tribes I. Desmantheæ. II. Eumimoseæ. III. Acacieæ.

# XIII.—BOTANICAL INFORMATION.

## *Latest Intelligence from Mr Gardner.*

Villa de Arroyas, (12° 3′ S. Lat. 47° 3′ W. Long.)
Province of Goyaz, *5th May,* 1840.

My Dear Sir,—Having but little that is very particular to inform you of, it was not my intention to write from this place; but as I am on the eve of leaving it, and as the post for the city of Goyaz is expected to pass in a few days, I have thought it better to give you some particulars respecting my labours since I last addressed you, which was from the Villa de Natividade. I started from the latter place on the 10th February, and reached this on the 27th. On the road I made some splendid additions to my collections, such as several species of the genus *Diplusodon,* a most beautiful *Epistephium,* an upright herbaceous plant, about two or three feet high, which would make a fine addition to the *Orchideæ* already in cultivation in England, but that its roots are not of a nature to allow of it being sent home alive. I have, however, beautiful dried specimens of it for all my subscribers.

From Natividade I gave you some particulars respecting a plant belonging to the same tribe which I had gathered there, and which I have since found abundant in moist upland campos in the neighbourhood. It will, no doubt, form a new genus, as it differs from *Vanilla* in habit, and in its free labellum, and from *Epistephium* by being ecalycalate. I have drawn up a description of it, as well as a smaller species of the same genus, which I hope to be able to transmit to you, along with the specimens from Rio de Janeiro. As you have never sent me the last part of Lindley's *Orchideæ,* I cannot be certain whether the genus be nondescript or not, but as he only gives *Vanilla* and *Epistephium* as all the genera contained in his order *Vanillaceæ,* in his *Nat. Syst. of Botany* (edition 1836,) I cannot help believing that it is new. If so, I intend to name it in honour of my kind friend, J. E. Bowman, Esq., as the plant

(a leguminous shrub, and my former *Bowmania*) which I sent you from Villa de Crato in the province of Ceará, and which I have since found both in Piauhy, and in this neighbourhood abundantly, is no doubt well known. It is a beautiful shrub, and I have now obtained fine specimens of it. The Villa de Arroyas is situated in a little valley on the top of a broad hilly rather elevated serra, and the country around being very diversified, it affords an excellent field for the Botanist, and I am happy to inform you that I have been very fortunate during the months which I have remained here.

My collection, since I left Natividade, amounts to 369 species, all of them interesting to the Botanist; and since I quitted the city of Oeiras, I have collected in all 1486, of the greater part of which I have thirty full sets; and I flatter myself that this is no bad work for nine and a half months. The vegetation here is very different from any I have met with in Brazil. I cannot mention the number of fine plants that I have found since I last wrote you, but among others I may note four fine species of *Vellozia*, one of which bears white flowers, the other three purple ones: also six or eight kinds of *Diplusodon*, an herbaceous *Angelonia*, a *Cybianthus*, two *Vochysiæ* an arborescent *Panax*, numerous noble *Melastomaciæ*, a *Cerasus*, two species of *Eryngium*, an *Andromeda*, a *Loasa*, a beautiful yellow-flowered *Allamanda*, several very striking *Gentianeæ*, such as two beautiful *Lasianthi* with blue flowers, and two kinds of *Exacum*, one of them about four feet high, common in upland campos, and very graceful in its habit; a most beautiful little *Anemia*, its leaves exactly resembling those of *Achillæa millefolium*, several species of *Acrostichum*, a few *Mosses*, a great variety of *Grasses*, numerous *Leguminosæ*, *Hyptides* and *Justiciæ;* many fine species of *Loranthus* and *Viscum*, several *Malvaceæ*, and a beautiful annual *Gloxinia*, also a most splendid collection of *Compositæ ;* in no place have I met with so many of the latter tribe as here. Among them I would particularly enumerate the genera *Vernonia* and *Eupatorium*, also three species of *Pycnocephalum*, seven or eight of *Ooclinium*, (DC.) one of which is

nearly related to De Candolle's *O. capillare*, but its leaves are five- not three-partite; it is a pretty annual, and I have obtained good specimens of it, and ripe seeds. I have also found several plants that perhaps belong to *Anomostephium*, (DC.) and a host of others which I have not had time to examine. I am sure that of *Compositæ* alone I have not much fewer than three hundred species; and if Mr Bentham still continues to publish my collections of this tribe, he will have a good deal to do when these reach England. I have also a large stock of seeds for Mr Murray, and an excellent set of the *Coleopteræ* of this country for my kind friend Mr (now I suppose Dr) Joseph Hooker, who will I am sure be pleased with them as the specimens are in perfectly good condition, and being collected in this inland province, there can be no doubt many of them will be new to him.

You cannot conceive the anxiety I now experience to hear from you and my other friends. Two years have elapsed since the date of your last letters, and how many changes may not have taken place during that period! I fully anticipate, however, the happiness of receiving tidings from home on my arrival at Villa Rica, or at San Joao del Rey, in the province of Minas Geraes. The rains have now ceased, and the season is become fine for travelling; every thing is prepared for starting, and I hope to take my departure tomorrow afternoon. During my stay here, I have acquired four horses and a little money by the practice of medicine; and these earnings will both prove highly favourable to me, as I was much in want of horses, and have now the money they would have cost me. My troop consists at present of sixteen horses and four men, besides a dog, monkey, and several parrots.

I am particularly anxious to quit this province without delay, as there seems every prospect of its soon being involved in civil war, similar to what now exists in Piauhy and Maranham. A few days ago, tidings came that the revolutionists had entered the province of Goyaz, and taken possession of San Pedro de Alcantra, which is situated on the

Rio Tocantines, and that they were about to come up the river. The national guards have been called out, and are now under drill; a most motley group they are, of all colours, all sizes, and all kinds of dresses. This place contains neither arms nor ammunition, but most of the men have brought their own fowling-pieces with them, and those who have none of these implements, are furnished with a long knife, tied to the end of a short pole. These soldiers are about one hundred and forty in number; and, I am satisfied, that half-a-dozen British military men would speedily put them all to flight.

I have just learned that Piauhy is in a state of complete anarchy, and I grieve to hear that several of my friends have fallen victims to popular fury. I would not for ten thousand pounds go back the road we have just come. There can be no doubt that Brazil is fast approaching to republicanism. I hope to be able to write you more fully from Minas Geraes.

Your obedient servant,

G. GARDNER.

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## *Report on the Tea Plantations in Assam.*

(THE following are extracts from a valuable "*Report on the Manufacture of Tea, and on the Extent and Progress of the Tea Plantations in Assam*, by C. A. BRUCE, Superintendant of the Tea Culture." The Report was published in the *Madras Journal of Literature and Science, September*, 1839, of which it occupies thirty pages. We omit all that regards the manufacture, and amount of produce expected to be obtained from the plantations.)

"In drawing out this report, it gives me much pleasure to say, that our information and knowledge respecting Tea and Tea tracts are far more extensive than when I last wrote on the subject; the number of tracts now known amounting to 120, some of them very extensive both on the hills and in the plains. A sufficiency of seeds and seedlings might be collected from these tracts in the course of a few years to

plant off the whole of Assam; and I feel convinced, from my different journeys over the country, that but a very small portion of the localities are as yet known.

"Last year in going over one of the hills behind *Jaipore*, about 300 feet high, I came upon a Tea tract, which must have been two or three miles in length, in fact I did not see the end of it; the trees were in most parts as thick as they could grow, and the Tea seeds (smaller than what I had seen before) fine and fresh, literally covered the ground; this was in the middle of November, and the trees had abundance of fruit and flower on them. One of the largest trees I found to be two cubits in circumference, and full forty cubits in height. At the foot of the hill I found another tract, and had time permitted me to explore those parts, there is no doubt but I should have found many of the Naga hills covered with Tea. I have since been informed of two more tracts near this. In going along the foot of the hills to the westward, I was informed that there was Tea at *Teweack*, or near it: this information came too late, for I had passed it just a little to the east of the Dacca river, at a place called *Cheridoo*, a small hill projecting out more than the rest to the northward, with the ruins of a brick temple on it; here I found Tea, and no doubt if there had been time to examine, I should have found many more tracts. I crossed the Dacca river at the old fort of *Ghergong*, and walked towards the hills, and almost immediately came upon Tea. The place is called *Hauthoweah*. Here I remained a couple of days, going about the country, and came upon no fewer than thirteen tracts. A Dewaniah who assisted me to hunt out these tracts, and who was well acquainted with the leaf, as he had been in the habit of drinking tea during his residence with the Singphoes, informed me that he had seen a large tract of Tea plants on the Naga mountains, a day's journey west of *Chiridoo*. I have no reason to doubt the veracity of this man; he offered to point out the place to me, or any of my men, if they would accompany him; but as the

country belonged to Raja Poorunda Sing, I could not examine it. I feel convinced the whole of the country is full of Tea.

"Again, in going further to the south-west, just before I came to *Gabrew* hill, I found the small hills adjoining it to the eastward, covered with Tea-plants. The flowers of the Tea on these hills are of a pleasant delicate fragrance, unlike the smell of our other Tea-plants; but the leaves and fruit appear the same. This would be a delightful place for the manufacture of Tea, as the country is well populated, has abundance of grain, and labour is cheap. There is a small stream called the *Jhangy* river, at a distance of two hours' walk: it is navigable, I am informed, all the year round for small canoes, which could carry down the Tea, and the place is only one and a half day's journey from *Jorehaut*, the capital of Upper Assam. South-west of *Gabrew Purbut* (about two days' journey) there is a village at the foot of the hill, inhabited by a race called Norahs; they are Shans, I believe, as they came from the eastward, where Tea abounds. I had long conversations with them, and the oldest man of the village, who was also the head of it, informed me, that when his father was a young man, he had emigrated with many others, and settled at *Tipum*, opposite *Jaipore*, on account of the constant disturbances at *Munkum*, that they brought the Tea-plant with them and planted it on the *Tipum* hill, where it exists to this day; and that when he was about sixteen years of age, he was obliged to leave *Tipum* on account of the wars and disturbances at that place, and take shelter at the village where he now resides. This man said he was now eighty years of age, and that his father died a very old man. How true this story is, I cannot say, and do not see what good it would do the old man to fabricate it. This was the only man I met with in my journeys about the country who could give any account of the Tea-plant, with the exception of an Ahum, who declared to me that it was Sooka, or the first Kacharry Rajah of Assam, who brought the Tea-plant from *Munkum;* he said it was written in his *Putty*, of

history. The *Ahum-Putty* I have never been able to get hold of; but this I know, that the information about the Tea-plant pointed out by the old Norah man, as being on the *Tipum* hill, is true; for I have cleared the tract where it grew thickest, about 300 yards by 300, running from the foot of the hill to the top. The old man told me his father cut the plant down every third year, that he might get the young leaves.

"To the west of *Gabrew*, I did not find any Tea; but to the westward of the *Dhunseeree* river I found a species, though not the same as that we use. If the people on the west side of the *Dhunseeree* river were acquainted with the true leaf, I think Tea would be found. I planted it all along the route I went, which may lead to its eventual discovery; but people should be sent to search for the plant who are really acquainted with it. I think a vast quantity of Tea would be brought to light if this were done; our tracts are distributed all over the country.

"In giving a statement of the number of Tea tracts, when I say that *Tingri*, or any other tract is so long and so broad, it must be understood, that space to that extent only has been cleared, being found to contain all the plants which grew thickly together; as it was not thought worth while at the commencement of these experiments, to go to the expense of clearing any more of the forest for the sake of a few straggling plants. If these straggling plants were followed up, they would in all probability be found gradually becoming more numerous, until you found yourself in another tract as thick and as numerous as the one you left; and if the straggling plants of this new tract were traced, they would by degrees disappear until not one was to be seen. But if you only proceeded on through the jungles, it is ten to one that you would come upon a solitary Tea-plant, a little further on you would meet with another; until you gradually found yourself in another new tract, as full of plants as the one you had left, growing absolutely so thick as to impede each other's growth. Thus I am convinced one might go on for

miles from one tract into another. All my Tea tracts about *Tingri* and *Kahung*, are formed in this manner, with only a patch of jungle between them, which is not greater than what could be conveniently filled up by thinning those parts that have too many plants. At *Kahung* I have lately knocked three tracts into one, and I shall most probably have to continue doing the same until one tract shall be made of what now consists of a dozen. I have never seen the end of *Juggundoo's* Tea tract, nor yet *Kujudoo's* or *Ningrew's*. I feel confident that the two former run over the hills and join, or nearly join, some of our tracts in the *Muttuck* country. Nor have I seen the end of *Kahung* tract, all about that part of the country being one vast succession of Tea from *Rungagurra* on the *Debrew*, to *Jaipore* on the *Buri Dehing*. The Tea localities are thickly scattered—those that are known; and they are but a small portion compared to those that are unknown. There is the *Namsong* tract on the *Naga* hills, the largest that has yet been seen, and the extent of which is not ascertained. The tracts on the *Gubind* hills are unknown; and this is likewise the case with *Haut Holah* and *Cheridoo;* so that there is a large field for improvement throughout, to say nothing of the *Singho* tracts, which may be found to be one unbounded link to *Hookum;* and who knows but it crosses the Irrawaddy to China? Many Tea tracts I know have been cut down in ignorance by the natives, to make room for the rice field, for firewood, and fences, but many of these tracts have sprung up again, more vigorous than before. Witness that at *Ningrew*, where the natives say that every thing was cut down, and the land planted with rice, except on the high ground.

"With respect to the Tea plant being most productive on high or low ground, I cannot well say, as all our tracts are on the plains; but from what little I have seen of the hill tracts, I should suppose they were not more productive. In China the hill tracts produce the *best* Teas, and they may do the same here. Almost all my tracts on the plains are nearly on the same level, I should think. *Nudwa* perhaps is

a little higher than *Tingri*, and *Tingri* a little higher than *Kahung*, but I believe they are equally productive; although if I leaned towards any side, with my limited experience, I should say that the low land, such as *Kahung*, which is not so low as ever to be inundated by the strongest rise in the river, is the best. The plants seem to love and court moisture, not from stagnant pools, but running streams. The *Kahung* tracts have the water in and around them; they are all in heavy tree jungles, which makes it very expensive to clear them.

"I may here observe, that the sun has a material effect on the leaves; for as soon as the trees that shade the plants are removed, the leaf, from a fine deep green, begins to turn into a yellowish colour, which it retains for some months, and then again gradually changes to a healthy green, but now becomes thicker, and the plant throws out far more numerous leaves than when in the shade. The more the leaves are plucked, the greater number of them are produced; if the leaves of the first crop were not gathered, you might look in vain for the leaves of the second crop. The Tea made from the leaves in the shade is not near so good as that from leaves exposed to the sun; the leaves of plants in the sun are much earlier in season than of those in the shade; the leaves from the shady tract give out a more watery liquid when rolled, and those from the sunny a more glutinous substance. When the leaves of either are rolled on a sunny day, they emit less of this liquid than on a rainy day. This juice decreases as the season advances. The plants in the sun have flowers and fruit much earlier than those in the shade, and are far more numerous; they have flowers and seeds in July, and fruit in November. Numerous plants are to be seen that by some accident, either cold or rain, have lost all their flowers, and commence throwing out fresh flower-buds more abundantly than ever. Thus it is not unfrequent to see some plants in flower so late as March (some of the China plants were in flower in April) bearing at once the old and the new seeds, flower-buds, and full-blown

flowers—all at one and the same time. The rain also greatly affects the leaves; for some sorts of Tea cannot be made on a rainy day; for instance the *Pouchong* and *Mingehew*. The leaves for these ought to be collected about 10 A.M. on a sunny morning when the dew has evaporated. The *Pouchong* can only be manufactured from the leaves of the first crop; but the *Mingehew*, although it requires the same care in making as the other, can yet be made from any crop, provided it is made on a sunny morning. The Chinese dislike gathering leaves on a rainy day for any description of Tea, and never will do so, unless necessity requires it.

"The China Black-Tea plants which were brought into *Muttuck* in 1837, amounted in all to 1609—healthy and sickly. A few of the latter died, but the remainder are healthy, and flourish as well as if they had been reared in China. All the China seedlings on *Tipum* hill have been destroyed by some insect.

"The Assam and China seedlings are near each other; the latter have a much darker appearance. I have made but few nurseries, or raised plants from seed, as abundance of young plants can be procured, of any age or size, from our Tea tracts. There may be about 6,000 young seedlings at *Chubwa;* at *Deenjoy* about 2,000; at *Tingri* a few; and some at *Paundooah*. In June and July 1837, 17,000 young plants were brought from *Muttuck*, and planted at a place called *Toongroong Patar*, amongst the thick tree jungles of *Sadiya*.

"In March of the same year six or eight thousand were brought from *Muttuck*, and planted in different thick jungles at *Sadiya;* many of these died in consequence of the buffaloes constantly breaking in amongst them; the rest are doing well, but I am afraid will be killed from the above cause; and now that I have removed to *Jaipore*, they are too far off for my personal superintendence.

"In 1838, 52,000 young Tea plants were brought from the *Nemsong Naga* hill tracts, about ten miles from *Jaipore;* a great portion of these have been lately sent to Calcutta, to

be forwarded to Madras: should they thrive there, it is my opinion that they will never attain any height, at least not like ours, but be dwarfish like the China plants. *Deenjoy*, *Chubwa*, *Tingri*, and *Gheela-Jhan* tracts have been filled up or enlarged with plants from the jungle tracts. In transplanting from one sunny tract to another, when done in the rains, very few, if any, die; if the plants be removed from a deep shade to a sunny tract, the risk is greater, but still, if there is plenty of rain, few only will die. If from a deep shade to a piece of ground not a Tea tract, and exposed to the sun—for instance from the *Naga* hills to *Jaipore;* if there be plenty of rain, and the soil congenial, as it is at this place, few will die; if shaded by a few trees, less will perish; if taken from shade, and planted in shade and the soil uncongenial, but there is plenty of rain, the greater portion will live; witness *Toongroong Patar* at *Sadiya*. If the plants are brought from deep shade, and planted in the sun in uncongenial soil, let them have ever so much rain, not one in fifty will be alive the third year; witness 30,000 brought to *Sadiya*. I believe the Tea plant to be so hardy that it would almost live in any soil, provided it were planted in deep shade when taken to it. There should be plenty of water near the roots, but the plant should always be above inundation. As soon as it has taken root, which it will soon do, the shade may be removed, and there will be no fear of the plant dying.

"In clearing a new Tea tract, if the jungle trees are very large and numerous, it would be as well to make a clean sweep of the whole, by cutting them and the Tea plants all down together; for it would be impossible to get rid of so much wood without the help of fire. The Tea plants, if allowed to remain, would be of little use after they had been crushed and broken by the fall of the large trees, and dried up by the fire; but admitting that they could escape all this, the leaves of trees from twelve to twenty feet high could not be reached, and if they could, they would be almost useless for Tea manufacture, as it is the young leaves, from young trees, that produce the best Teas. But if all were cut down

and set fire to, we should have a fine clear tract at once, at the least expense, and might expect to have a pretty good crop of Tea one year after the cutting, or, at furthest, the second year; for it is astonishing with what vigour the plant shoots up after the fire has been applied. And we gain by this process; for, from every old stock or stump cut down, ten to twelve more vigorous shoots spring up, so that in the place of a single plant you have now a fine Tea bush. I think from what I have seen of these plants, that if cut down every third year, they would yield far superior Teas; neither am I singular in this opinion; the Green-Tea-China-men having told me that they cut down their plants every ninth year, which may be reckoned equivalent to our third year, taking into consideration the size of our trees and the richness of our soil. Our trees, or plants, are certainly more than four or five times the size of theirs, and must consequently yield so many times more produce; theirs is the dwarf, ours the giant Tea. The size of the leaf matters nothing, in my opinion, provided it is young and tender; even their diminutive leaf, if one day too old, is good for nothing.

"With respect to what are called the *Singpho* Tea tracts, I am sorry to say we have not been able this year to get a leaf from them, on account of the disturbances that have lately occurred there; nor do I believe we shall get any next year, unless we establish a post at *Ningrew*, which I think is the only effectual way to keep the country quiet, and secure our Tea. The Tea from these tracts is said by the China-men to be very fine. Some of the tracts are very extensive, and many may run for miles into the jungles for what we know; the whole of the country is capable of being turned into a vast Tea garden, the soil being excellent, and well adapted for the growth of Tea. On both sides of the Buri-Dehing river the Tea grows indigenous; it may be traced from tract to tract to *Hookum*, thus forming a chain of Tea tracts from the Irrawaddy to the borders of China, east of Assam. Ever since my residence at Sudiya this has been confirmed year after year by many of my Kamtee, Singpho, and Dewaneah

acquaintances, who have traversed this route. It is therefore important for us to look well to our Eastern frontier, on account of our capability to extend our Tea cultivation in that direction. England alone consumes 31,829,620 lbs., nearly four laks of maunds, annually. To supply so vast a quantity of Tea, it will be necessary to cultivate all the hills and valleys of Assam; and on this very account a post at *Ningrew* becomes doubly necessary. A few years hence, it may be found expedient to advance this frontier post to the top of the *Patkai* hill, the boundary line of our eastern frontier. Any rupture with Burmah would add to our Tea trade, by taking from them *Hookum* and *Munkoom*, and having the Irrawaddy as our boundary line. These countries are nominally under the Burmese, as they pay a small annual tribute; but this can never be collected without sending an armed force. They are said to be thinly inhabited, the population being kept down by the constant broils and wars, which one petty place makes upon another for the sake of plunder. All the inhabitants drink Tea, but it is not manufactured in our way; few, it is said, cultivate the plant. I have for years been trying to get some seeds or plants from them, but have never succeeded, on account of the disturbed state in which they live. The leaves of their Tea plants have always been represented to me as being much smaller than ours.

"*Muttuck* is a country that abounds in Tea, and it might be made one extensive, beautiful Tea garden. We have many cultivated experimental tracts in it; we know of numerous extensive uncultivated tracts, and it appears to me that we are only in the infancy of our discoveries as yet. Our Tea, however, is insecure here. It was but a month or two ago that so great an alarm was created, that my people had to retire from our Tea gardens and manufacture at Deenjoy and Chubwa, which will account for the deficiency of this year's crop. Things must continue in this state until the government of the country is finally settled; for we are at present obliged, in order to follow a peaceful occupation, to have the means of defending ourselves from a sudden attack,

ever since the unfortunate affairs at Sudiya. Before the transfer of the Tea tracts in this country can be made, it will be necessary, in justice to all parties, to know if *Muttuck* is, or is to become ours or not. The natives at present are permitted to cultivate as much land as they please, on paying a poll-tax of two rupees per year; so that if the country is not ours, every man employed on the Tea will be subject to be called on for two rupees per annum, to be paid to the old Bura Senaputy's son, as governor of the country. This point is of vital importance to our Tea prospects up here. Many individuals might be induced to take Tea grounds, were they sure that the soil was ours, and that they would be protected and permitted to cultivate it in security.

"In looking forward to the unbounded benefit the discovery of this plant will produce to England, to India,—to millions, I cannot but thank God for so great a blessing to our country. When I first discovered it, some fourteen years ago, I little thought that I should have been spared long enough to see it become likely eventually to rival that of China, and that I should have to take a prominent part in bringing it to so successful an issue. Should what I have written on this new and interesting subject be of any benefit to the country, and the community at large, and help a little to impel the Tea forward to enrich our own dominions, and pull down the haughty pride of China, I shall feel myself richly repaid for all the perils and dangers and fatigues, that I have undergone in the cause of British India Tea."

JAIPORE, 10*th June*, 1839.

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## XIV.—*Notes on some South African Plants.* By G. A. WALKER ARNOTT, Esq., LL.D.

THE following notes were principally made about two years ago, and their substance communicated to my friends Sir W. Hooker, and Mr Harvey. They relate almost wholly to the third collection I received from Dregé, and would not have been published had I not found the same names under which

they were sent still retained in the general catalogue, printed in April this year. I presume therefore that E. Meyer who has named the specimens, and is engaged in describing them in his *Comment. de Pl. Afr. Aust.*, still adheres to the accuracy of his determinations, and my present wish is to indicate some points in which I differ from him, and to add some observations on a few other Cape plants.

I shall commence with the *Terebinthaceæ*, p. 26, of the catalogue dated February, 1838; the same names will be found in the catalogue of 1840, at p. 3.

The first genus mentioned is *Anafrenium*. From there being a species named *A. argenteum*, it seems to me that Meyer intends this to be the *Roemeria argentea*, Thunb.; and of that there can be no doubt. As the name *Roemeria* is applied generally to a genus of *Papaveraceæ*, a change is necessary in the present case; but it had been previously named *Heeria*, by Meisner, in his *Pl. Vasc. Gen.*, in 1836, and this name ought to be adopted. Alph. De Candolle and some others, propose to place this genus in *Myrsineæ*, but Ecklon and Zeyher appear to me to have properly referred it to *Terebinthaceæ*, subord. *Cassuvieæ*. As their generic character is in several respects imperfect, I propose to substitute the following.

HEERIA. *Meisn.*

*Roemeria*, Thunb.—*Anafrenium*, E. M.

*Flores* polygami. *Calyx* 5-(nunc 6-) partitus. *Petala* 5 (nunc 6), oblonga, recurva, sub disco inserta, æstivatione imbricata. *Stamina* 5 (nunc 6), petalis alterna, omnia antherifera, sub disco inserta. *Discus* cupulatus. *Ovarium* in flore masculo abortivum; in femineo sessile, 1-loculare; *ovulum* unicum, ex apice funiculi e basi loculi orti pendulum. *Stylus* alte trifidus. *Stigmata* 3, capitata. *Cætera ut in descr. E. et Z.*

2. *Anasillis* is the next genus in the catalogue, but *Anasillis angustifolia*, E. M., is *Loxostylis alata*, Ant. Sprengel *in Ecklon et Zeyher, Enumeratio, p.* 152, a name which must

be retained. This is inserted among the *Burseraceæ*, by Ecklon and Zeyher, as well as by Harvey, in his genera of South African plants; but the propriety of this arrangement is doubtful. As their analysis does not quite agree with mine, I shall add it here.

LOXOSTYLIS. *Ant. Spr.*

*Anasillis*, E. M.

*Flores* diclines.—MASC. *Calyx* profunde 5-partitus, segmentis lanceolatis, acuminatis. *Petala* 5, lanceolata, acuminata, calycem duplo superantia, per æstivationem imbricata torta. *Stamina* 5, inæqualia, petalis alterna, inter squamas 5 emarginatas inserta. *Ovarium* nullum.—FŒM. *Calyx* 5-partitus. *Petala* 5, calyce breviora. *Stamina* ut in flore masc. at abortiva. *Ovarium* obliquum, 2—4-loculare, loculo unico ovuligero. *Ovulum* ex apice funiculi e basi loculi orti pendulum. *Styli* 1—4, distincti vel coaliti, unicus fertilis, cæteri abortivi. *Stigmata* capitata. *Drupa* exsicca, ovalis, obliqua, abortu 1-locularis, 1-sperma, calyce persistente aucto membranaceo inclusa, eoque dimidio brevior. *Albumen* nullum. *Cotyledones* crassæ, foliaceæ.—Arbores. Folia *pinnata, petiolo marginato, foliolis oblongo-linearibus vel lanceolatis.* Flores *albi fasciculati.*

From this analysis, it is obvious that *Loxostylis* must belong to the *Sumachineæ*, and is not far removed from *Rhus*.

3. *Pythagorea rufescens*, E. M. I presume that this genus is intended not to be a new one, but is the *Pythagorea* of Loureiro, with whose character it agrees. *Pythagorea* is however the same as *Blackwellia* of Commerson, a name that is usually adopted, but unknown as a South African genus. How E. Meyer could place it in *Terebinthaceæ*, is not quite clear, as there can be no question about its belonging to *Homalineæ*. Mr Harvey in his genera of South African plants, mentions two genera of *Homalineæ*, found there. The one is *Trimeria*, Harv. l. c. p. 417; this sometimes occurs in herbaria under the name of *Celastrus ilicinus*, Burch, which, however, according to the short character given, must be

very different; and also of *Casearia capensis*, Ant. Spr.: I do not find it in Ecklon and Zeyher's works. The other is *Eriudaphus*, N. ab E.; this last is still retained by Endlicher, in his *Gen. Pl. p.* 923, in *Homalineæ.* This order has a fascicle of one or more stamens opposite the inner divisions of the perianth, while opposite to the outer segments there ought to be no stamens, but a mere gland; and the ovary coheres at the base with the bottom of the perianth. In *Eriudaphus*, however, the ovary is perfectly free, and there are stamens also opposite to the outer pieces of the perianth. In the true *Homalineæ*, the fruit is capsular; in *Eriudaphus*, it is baccate. These circumstances induce me to remove this genus to *Bixineæ*, nor do I perceive the slightest difference between it and *Phoberos* of Loureiro, of which several species are described in Wight and Arn. *Prod. Fl. Penin. I. O. p.* 29. In that work, from the resemblance of the genus to *Flacourtia*, we improperly referred it to *Flacourtianeæ*, but the placentæ are simple, and Endlicher (*Gen. p.* 919) has correctly brought it near *Prockia.* Nees ab Esenbeck takes no notice of the beak to the anthers in his *Eriudaphus*, but in three or four Cape species before me, I observe this character more or less distinctly; it is particularly so in Dregè's No. 3576, inserted among his *Myrtaceæ*, but which I presume is *Eriudaphus Eckloni*, N. ab. E., and still more in another species which I consider a variety of *Phoberos* (or *Eriudaphus*) *Zeyheri*; indeed it agrees better with Esenbeck's description of *Ph. Zeyheri*, than specimens I have from Zeyher (No. 858), in which last the leaves are often ovate and acute; it is known by the name of Wolf's Thorn, and the spines are in one specimen before me eight inches long, and three-eighths of an inch thick. The structure of the anthers to which I have alluded induces me to refer *Rhinanthera* of Blume likewise to *Phoberos*, and to consider his description of the fruit to be erroneous. The placentæ are, as I have said above, simple, and seem to be constantly two in number.

4. *Rhus oblongifolia*, E. M. Of this the following is the analysis:—*Sepala* 5, rotundata, concava, fimbriato-ciliata,

æstivatione imbricata. *Petala* 5, sepalis minora, rotundata, longe lanato-fimbriata, basi intus squama libera petaloidea fimbriata instructa. *Discus* annularis, completus. *Stamina* sub 20, intra discum inserta. *Filamenta* antheris subbreviora, dense albo-pilosa. *Antheræ* erectæ, oblongæ, subapiculatæ, biloculares, loculis parallelis. *Ovarii* vestigia nulla. —Folia *impari-pinnata; foliola elliptico-oblonga, subæqualia*. Panicula *terminalis, densa.*

From this there can be no doubt of the plant belonging to *Sapindaceæ*, and probably of being a second species of *Prostea*, Camb., with which it agrees in many particulars; this however I cannot determine without the female flowers and fruit.

5. *R. pauciflora*, Th., and *Rh. alata*, *Th.?* These two appear to be the same species, and constitute the *Hippobromus alatus*, E. and Z., a genus which is referred by Ecklon and Zeyher, and Harvey, to *Burseraceæ*, but decidedly belongs to *Sapindaceæ*, where indeed it has been placed, but among the doubtful genera, by Endlicher (*Gen. p.* 1074). The petals are destitute of a scale or appendage, and are inserted under the disk. Ecklon and Zeyher also consider their plant to be *R. alata*, Th., but they refer *R. pauciflora*, Th., to a very different one, the *Amyris inæqualis*, Ant. Spr.; in this last the petiole is not margined, while in *R. pauciflora*, it is said to be so. I rather then, incline to agree with E. Meyer, and consequently in thinking that the above two species of Thunberg are mere varieties of *Hippobromus alatus*.

6. *R. obliqua*, Thunb. This specimen is covered with prickles, and as that character could not have escaped Thunberg, I can scarcely agree in supposing it to be his plant. The calyx is 4-partite. The capsule solitary, sessile, two-valved, and from one to two-seeded; its structure and that of the seeds is precisely as in *Zanthoxylon*, to the section *Fagara* of which genus I presume it belongs. The petiole is terete, and unarmed. It may be *Fagara capensis*, Thunb., but De Candolle refers that species to *Elaphrium*, on account

of having eight stamens, while Don removes all the Cape species of *Fagara* to *Burseraceæ*, and forms of them the genus *Fagarastrum*. In the above plant from Drege, there is no flower; but the whole habit and structure, so far as I could examine, are decidedly those of *Zanthoxylon*.

*R. obliqua*, Thunb., as well as perhaps *Elaphrium inæquale*, DC. (as already indicated by Ecklon and Zeyher) appear to me to be the same as *Amyris inæqualis*, Ant. Spreng. (E. et Z. En. p. 153); but the plant is neither a species of *Amyris*, nor of *Amyrideæ*, but like almost all the East Indian species of *Amyris*, belongs to *Aurantiaceæ*. The following is the analysis:

*Calyx* parvus, quadrifidus. *Petala* 4, hypogyna, ovalia, concava, patentia: alabastrum obpyriforme. *Stamina* 8, hypogyna, subæqualia, libera. *Filamenta* crassa, apice abruptim acuminata. *Antheræ* oblongæ, biloculares, longitudinaliter dehiscentes. *Ovarium* toro in stipitem elevato insidens, biloculare, subobcordatum. *Ovula* in loculis gemina, collateralia, angulo centrali medio inserta. *Stylus* ab ovario distinctus et subarticulatus, deciduus, crassus, ovarii longitudine. *Stigma* obtusum. *Bacca* sicca, 2-vel sæpius abortu 1-locularis, 1—2-sperma; pericarpium tenue, glandulosum. *Semen* inversum, testa membranacea, glabra. *Embryonis* recti atro-viridis exalbuminosi *cotyledones* carnosæ, basi minute auriculatæ. *Radicula* brevissima, supera, pubescens.—Arbor 10—15-*pedalis.* Folia *impari-pinnata; foliolis suboppositis, inæquilateris, articulatione insertis, ovato-lanceolatis, utrinque acuminatis, crenatis, pellucido-punctatis.* Flores *albi, parvi, paniculati; paniculæ paucifloræ terminales, vel versus ramorum apices axillares.*

The habit is that of *Clausena*, but the structure of the ovary approaches more to that of *Bergera*: from that however it differs by the quaternary proportion of the floral organs, and the ovules being in pairs; approaching in character to *Rissoa*, but with a widely different habit, and structure of style.

7. *R. melanocarpa*, E. M., *leucocarpa*, E. M., *erosa*, Th., *undulata*, Jacq., and *decipiens*, E. M., are all species of

*Schmidelia*, Lin., a genus which has not hitherto been recognised as South African. In the two first, and in the last of these, the style is bifid, and the ovary 2-celled; in the two others I find only stamens. In *R. melanocarpa*, the carpels are subglobose, one of them usually abortive; the petals are furnished with a scale. *R. leucocarpa* appears allied to *Schmidelia Africana;* the carpels are usually solitary by abortion, obovate, and nearly horizontal. In *R. erosa*, the petals are furnished with a hairy scale, and the filaments are hairy. Whether this and *R. undulata*, be the species intended by Thunberg, it is almost impossible to ascertain from the short characters given.

8. The other species of *Rhus* in Drege's catalogue all belong to that genus. Of these *R. tomentosa*, is *R. Plukenetiana*, E. and Z.; *R. mucronata* does not seem to be Thunberg's plant, but agrees with Burmann's *Afr. t.* 91, *f.* 2, which is the type of *R. Burmanni*, DC.; but it is scarcely *R. Burmanni*, E. and Z., since these authors refer to the *Un. It. n.* 683, which is quite a different species; it may, however, be *R. plicæfolia.* E. and Z. *Rhus n.* 6793, b. seems to be *R. incisa*, L.; *R. angustifolia* (but not of Linnæus) is *R. fastigiata*, E. and Z.; *R. pallida*, seems to be *R. denudata*, Licht.; *Rhus n.* 116, is *Rh. lucida, Lin.*

9. Although not in Drege's collection, I may here notice *Boscia undulata*, Thunb., or *Asaphes undulata*, DC., a very little known genus. All authors describe it with three styles and stigmata, and a four-celled fruit, a contradiction which has not escaped M. Adrien de Jussieu, in his memoirs on the *Rutaceæ.* But Thunberg may have actually described what he saw; the flowers are unisexual, and in the few which I have myself opened, I have found only three styles, while the fruit which I have seen is generally 4-celled, but this last is occasionally 3-celled, whence the normal state is, I have no doubt, to have four styles in the male flower, and four cells to the fruit. The stigma, which remains attached like a little cup to the top of the fruit, is perfectly different from

what we see in the sterile flower. The following is an analysis, as far as my specimens will admit:—

BOSCIA, *Thunb.* (*non Lam.*)

*Asaphes*, DC.—*Duncania*, Reich.

*Flores* diclines. *Calyx* brevis 4-partitus. *Petala* 4, calycem multo superantia, æstivatione contorto-convolutiva.—MASC. *Stamina* 8, 4 petalis opposita breviora, circa basin gynophori ovariorum rudimenta gerentis inserta. *Pistilla* 3—4, abortiva. *Styli* totidem, filiformia; stigmata punctiformia.—FŒM. *Stylus* nullus. *Stigma* sessile, latum, peltatum, in fructu concavum. *Fructus* carnosus, punctatus, 4-(nunc 3-) sulcatus, 4-(nunc 3-) locularis; loculis monospermis, 1—3 sæpe abortivis. *Semina* ovoidea, angulata, dorso convexa, unilocularia. *Embryo* subarcuatus.

From this it will be seen that in no one point does *Boscia* differ from *Vepris*, except in the structure of the seed, which in *Vepris* is described as two-celled, with one of the cells empty; an anomalous structure, perhaps the effect of accident, and which my specimens being only in flower, do not permit me to verify. The structure of the first is precisely similar to what is detailed in *Vepris*, by M. Adrien de Jussieu; and as the habit of the two genera is precisely alike, I feel disposed to unite them; indeed, admitting that the structure of seed is not here of importance, I scarcely see how *Boscia undulata*, is to be distinguished from *Vepris inermis*, except by the narrower foliage; and in the Mauritius plant that seems also to vary considerably; but whatever becomes of it as a genus, it must be removed with *Vepris* and *Toddalia* to the group of *Zanthoxyleæ*.

10. I have now alluded to all the *Cape Genera* placed in *Terebinthaceæ*, except two. The one is *Laurophyllus*: of this I have only seen the male flowers; and their examination inclines me to agree with Mr Harvey in referring it to the *Sumachineæ*. The most complete description of it is given by Bernhardi in the Linnæa xii., page 135, who has there

shown that *Botryoceras laurinum*, Willd. is the same plant; but both Mr Harvey and Professor Bernhardi maintain that the ovule is pendulous from the apex of the cell; this may however be an oversight, and the origin of the funiculus which supports the ovule overlooked. In some respects allied to this genus, according to Bernhardi, is *Apodytes dimidiata* E. M., but certainly not of the same order. The affinity of *Apodytes* to *Icacina Senegalensis* (of which *Chysobalanus luteus*, Sab. is a synonym,) is so obvious that I feel surprised at Endlicher omitting it at the close of *Olacineæ*, where *Icacina* is placed. The two principally differ by the origin of the style, that organ being terminal in *Icacina* as in the *Olacineæ*, whereas it is lateral in *Apodytes*, indicating as it were, a solitary simple pistillum. How far either of these belong to *Olacineæ*, I will not take on me to say: neither can I do so if Mr Brown's views of that order be strictly adhered to; at the same time they and the East Indian *Gomphandra* appear more allied to *Olacineæ* than to any other.

*Apodytes* may be recognised by the following short character:—

APODYTES *E. M.*

*Trimeria sp.?* Harv. mst.

*Calyx* 5-fidus. *Petala* 5, æstivatione valvata. *Stamina* 5, petalis alternantia; filamenta versus basin latiuscula: antheræ introrsæ, oblongæ, lineares, basi bifidæ. *Ovarium* obliquum, gibbum, 1-loculare. *Ovula* duo, collateralia appensa. *Stylus* lateralis, flexuosus (sc. primo erectus, dein super ovarium horizontaliter curvatus, demum erectus.) *Stigma* capitatum. *Fructus* coriaceo-carnosus, epulposus. *Semen* unicum.—Frutex foliis *petiolatis, alternis, simplicibus, subellipticis, coriaceis, margini undulatis, lucidis.* Paniculæ *terminales, folia paulo superantes.*

Found also by Zeyher (No. 673,) in the forests of Krakakamma, in the district of Uitenhage.*

* Since the above was written, I have received a letter from my friend Mr Bentham, in which he mentions that he has prepared a memoir on the *Olacineæ*, with a description and figure of this genus.

The other genus placed among the Cape *Terebinthaceæ*, but which I have not seen, is *Methyscophyllum*; the only description given of it is by Ecklon and Zeyher, and is imperfect, in so far as it does not state the number of ovules in the ovarium, and the structure of the seed. It is placed by these Botanists in Burseraceæ; but the stamens being as few as the petals, form a strong objection to this affinity, as already mentioned by Harvey; and besides, the leaves are opposite. Mr Harvey removes it to *Pteleaceæ*, a group now more correctly referred to *Zanthoxyleæ;* but to that arrangement I am not quite prepared to agree, although I prefer it to Ecklon and Zeyher's.

*(To be continued.)*

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## XV.—*Recent Botanical Letters of* Dr Robert Wight, *addressed to* G. A. W. Arnott, Esq., LL.D.

[*With a Portrait of the Author.*]

One object which we have always had in view in conducting a *Journal of Botany*, has been to make known some further particulars in the lives of authors and travellers, than can be gleaned directly from their publications. In those cases when their career of usefulness has, unhappily for science, terminated, and where materials are accessible, the duty of compiling a memoir is light and easy, and, the more agreeable, from a consciousness, that nothing requires to be withheld from our readers out of motives of delicacy towards him whose history we are commenting upon. Under these circumstances we have had peculiar pleasure in bearing testimony in the previous volumes of our Journal, to the merits of Telfair, Barclay, Fraser, Richard, Cunningham, Drummond, Douglas, Jack, Hall, Swartz, &c. It is otherwise with living naturalists, and especially regarding the labours of those of whom, as in the present case, we have lived on terms of intimacy and confidential intercourse. We here scarcely feel ourselves authorized in doing more than laying before our readers some extremely interesting letters which

Robt Wight

M.D. F.L.S. &c.

Surgeon on the East India Company's
Establishment, Madras.

have been addressed by Dr Wight, to his friend and coadjutor Dr Arnott, on the subject of Indian Botany.

We shall merely premise that Dr Wight is still in the prime of life, and enjoys an excellent constitution, although he has been upwards of twenty years a resident in the Madras Peninsula. He entered the Company's service at an early age as assistant-surgeon, and embarked for India, we believe, with little or no more knowledge of Botany than usually falls to the lot of a well-educated medical man. During the first three years, we have heard him say, he began to direct his attention to the vegetable productions with which he was every way surrounded; but in scientific Botany, he could make very little progress from being utterly destitute of books. At length he had the good fortune to become possessed of *Willdenow's Species Plantarum*, of *Persoon's Synopsis*, and of the Lichfield Society's translation of the *Genera Plantarum* of Linnæus. With these aids he proceeded joyously to investigate the Botany of the Madras Presidency; and, in 1823, found himself enriched with a herbarium of from five hundred to six hundred species, to all of which he had attached names to the best of his ability. With his characteristic generosity, and with that ardent desire to distribute his vegetable treasures wherever he thought they would be really useful, he despatched the whole of this collection to Edinburgh, as a present to Dr Graham; but these, unfortunately, never reached their place of destination, having perished in the wreck of the vessel in which they were embarked, off the Cape of Good Hope. From that period, till 1826, Dr Wight's professional duties, and the continual movement of his regiment, were a hinderance to his Botanical studies: nevertheless, he continued to form another considerable collection, partly at Vellore, and partly at Madras, (where he spent three months for the recovery of his health,) which was sent to England by Dr Shuter; and which, through the kindness of the late Robert Barclay, Esq., came into the possession of the Editor of this journal. On Dr Shuter's return to England, where he survived but a short period, Dr Wight was

appointed to succeed him as *Naturalist*, which situation he held for two years, when the appointment was abolished by the Governor, Mr Lushington. While holding that interesting and important situation, it was to be expected that one of Dr Wight's energetic character would employ himself heartily in favour of the cause in which he was engaged. He studied more systematically than he had hitherto done, and with far more adequate means, not Botany only, but all the several branches of Natural History, and made an extensive tour of investigation through the southern provinces, the outline of which is marked in Dr Wallich's map of India, published in the splendid *Icones Selectæ* of that author. In the course of that journey, which occupied nine months, we know that he amassed nearly two thousand species of plants, about two hundred birds, besides insects and minerals; but these collections, large as they were, did not satisfy our enthusiastic traveller. There was indeed no lack of zeal and diligence on his part; but, for want of previous experience, he had started with a deficiency of materials and assistance for the collecting and preserving so large a quantity of objects as presented themselves in so rich and fertile a country. To remedy this defect, he made his arrangements for a longer tour the following season, with means better suited to his wants; and was ready for starting in January, 1828, when he received the unwelcome tidings that the Natural History appointment was about to be *abolished*. In the course of the ensuing month, orders to that effect were issued, and instead of being allowed to accomplish this most important and interesting journey, Dr Wight received instructions to proceed to Negapatam in the quality of garrison-surgeon. Under these unfavourable circumstances, our friend's ardour in the cause of Botany was not in the least diminished: the novelty of the country and its productions inspired him with the most eager desire to obtain a thorough knowledge of them. He devoted the whole of his leisure hours to this pursuit, he sent collections at his own expense all over the country, and in the two and a half years that he was stationed at Negapatam,

he formed the greater portion of that vast Herbarium with which he shortly after proceeded to England, and which constitute the principal materials from which the first volume of of the *Prodromus Floræ Indiæ Orientalis Peninsulæ* has been compiled by Drs Wight and Arnott.

The following letters, written since Dr Wight's return to India, will prove, better than any language of ours can do, with what zeal and perseverance he still follows up his Botanical pursuits, and what ample provision he is making for the forth-coming volume of the *Prodromus*, and for his other important publications; and all this under many disadvantageous circumstances, in the full exercise of his professional duties, and frequently for a length of time confined to one small spot, and that an unproductive one, or its immediate vicinity.*—Ed.

Madras, *4th September*, 1834.

"Though I have now been a month in Madras, I have as yet allowed only one occasion of writing to you to pass unheeded, and that because it occurred so soon after my arrival. There is not at present any opportunity of despatching a letter, but as I am on the point of leaving Madras on a long march, and may not find it convenient to write again for some time, I have thought it better to address to you a few lines. This I now do under considerable disadvantages, from having already put off too long, and having many things still to attend to before starting; and the day of doing so is sadly close at hand. I have as yet done little in the Botanical line, indeed I may say nothing, except roughly arranging a considerable collection of plants, brought me by my collectors,

* Besides the two works noticed at p. 437 of the 2d volume of this Journal, Dr Wight has published several excellent botanical papers in the *Madras Journal of Literature and Science*, and, in this country, in our *Botanical Miscellany*, *Companion to the Botanical Magazine*, 1st vol. of the *Journal of Botany*; and, along with Dr Arnott, the *Prodromus Fl. Pen. Ind. Or.* vol. 1st, *Contributions to the Botany of East India*, and some memoirs in *Jameson's Edinburgh Philosophical Journal*.

with the intention of sending you any things that I might find new. But on this, as on many other occasions, I found it easier to resolve than to perform rightly; for although there are a good many new things, yet I could not possibly find time enough to go over the whole a second time to lay them out and number them for transmission. There is a considerable number of drawings also, among others a good one of *Cocculus macrocarpus.* What makes the circumstance more annoying is, that I am obliged to leave all my plants and books behind me, without a chance of seeing them for the next six or eight months. I am posted to a regiment now at Bellary, three hundred miles north-west of Madras, which corps is under orders to march about the beginning of the year to Palamcottah, near Cape Comorin, a distance of about seven hundred miles, and till we get there, I must do without these excellent companions. In the course of so long a march, I hope to add greatly to my collection, and I think I shall get a host of new things, as the greater part of it is through countries I have not traversed before, or so long ago, that I derived little benefit from them.

For the purpose of agitating the subject of Botany on this side of India, I have now a paper publishing in a philosophical journal lately established here, under the title of a review of Royle's work, but in truth presenting a general view of the objects and advantages to be derived from the study of Botany. I have been spoken to (privately) by the Secretary to our Medical Board about undertaking to prepare a set of outline drawings and dissections of the plants mentioned in Ainslie's *Materia Medica*, to be lithographed in the same way as our catalogue. I think that in the course of a year or two it will be quite possible to procure and figure all the plants required for the work, and if I see a prospect of its being successful, I shall probably undertake it, following the arrangement of our *Prodromus*, thereby making it both a medical and botanical work.

There has within a very recent period been *two small wars* here, both in countries unknown to Europeans; one, among

the western; the other, the eastern hills. Unfortunately there was not a botanist with either of our armies, so that both opportunities of investigating these districts were lost. From what I have heard, there appears strong reason to believe that the *Aconitum ferox* is a native of the Peninsula, the wells in the North Circars having been poisoned with a root in the same way as was attempted in Nepaul, and unfortunately with more success; many of the troops suffered severely from its effects before the cause was discovered: as yet, we can however only conjecture that the root is an Aconite, the plant not being seen. . . . . . . My only discovery here is an Asclepiadeous plant belonging to the tribe *Periploceæ*, of which there are specimens in my herbarium under the name of *Echites grandiflora*; it is nearly allied to Wallich's *Finlaysonia*, and Brown's *Cryptostegia*, if not the identical plant, a point which I have not yet been able to determine for want of my books. I got some specimens of what I think a new genus of *Primulaceæ*, so like a gentian that nothing short of the positive certainty of finding the stamens opposite to the lobes of the corolla, could have made me think it any thing else. I have also got specimens of *Colebrookia*, which was new to me, and some two or three other things which I have not yet carefully examined.

P.S.—*8th Sept.* I set off to-day for Bellary, and have no time to add more.

Bellary, 11*th October*, 1834.
(N. Lat. 15° 15′, E. Long. 77°.)

I informed you in my last, that I had received great additions to my herbarium since my arrival at Madras. I was sorry that time was not allowed me to lay out specimens for transmission to you, and not less so, that I had been obliged to leave them and the greater part of my books and herbarium behind me. The want of these silent monitors I feel more and more every day, owing to my having added considerably to my collections in the course of my journey to

this place; while for want of my specimens I am occasionally at a loss to determine, whether plants differing from the descriptions, are species or varieties. This difficulty I have often experienced among the *Polygalæ*, partly it is true from its being said in the generic character that the lateral lobes of the corolla are always abortive, which is so far from being the case, that I have now, I believe, as many as four species recently collected, with the lateral lobes exceeding the alæ. In some they are so conspicuous when growing that I at first sight took them for *Crotalarias*, the said *abortive* petals resembling pretty large vexillums. Perhaps the generic character ought to have the word *often* inserted before "abortive," which might suggest a convenient division of the genus into two groups, those with and those without lateral lobes or petals to the corolla.*

I have lately found *Polanisia felina*, and seen abundance of *Caparis divaricata*, but not one plant in flower. Of the *Malvaceæ* I have as yet gathered only a few, but have found wild, for the first time, the *Hibiscus eriocarpus* in dense jungles near Nagary, a fine country for botanizing; but unfortunately I was a few weeks too early to reap the full advantages of the opportunity I had while passing through it. I had not been there before, but would like to go again and for a longer time. I have now got a large supply of *Byttneria herbacea*, and also of *Lagunea lobata*, the last not in a good state. For the former I was a little too early, there being very little fruit; in respect to it, I made the following note with reference to the stamens:—"Filaments 10, five of them sterile, somewhat ligulate, obtuse, sometimes anther-bearing; 5 fertile, each divided at the apex, and bearing two one-celled anthers, or rather perhaps a single double anther,

* At the moment of writing the above, Dr Wight appears to have misunderstood the generic character; comparing *Xanthophyllum* with *Polygala*, it will be seen that the two symmetrical petals of the former are wanting in the latter; that is, there are only three petals more or less combined in *Polygala* (not *five*); moreover it is the second and third petals, not the fourth and fifth, which are abortive.—G. A. W. A.

with widely separated cells." I met with it on a hill near Curcumbady, among long grass and low jungle. I have at length nearly determined that *Riedleia corchorifolia*, and *concatenata* are the same, by finding them united on different branches of the same plant: but I am not quite certain, and cannot finally determine the point here, the species not being natives of this district, so far at least as I have yet seen. I think, however, that I am right, and if so, *R. concatenata* is only a more advanced stage of *R. corchorifolia*. *Waltheria indica* is a most variable plant, if the varieties we meet with in this country are all the same species: I gathered specimens almost silky and white on the same spot, with others of a deep green and comparatively glabrous, and yet I could see no difference except in the quantity and harsher nature of the hairs of the green one.

I have got a fine new species of *Melhania*, ("*M. rupestris*, *Nob.*, leaves cordate ovate crenato-serrated, villous above, whitish tomentose and reticulated underneath; peduncles about 3-flowered, exceeding the petiole; involucral leaves broad cordate at the base, acuminated, persistent (?); sepals lanceolate acute, densely tomentose; petals oblong, obtuse, longer than the calyx; sterile and antheriferous filaments united by a membrane at the base; capsule (immature) tomentose.—A small shrub with long diffuse branches.—In a rocky glen at Talapoodatoor, Cuddapah district.")

*Grewia pilosa*, if I have not mistaken the species, is a very curious plant, it is a large scandent shrub with stem and larger branches acutely 4-angled, and grooved between the angles: in my plant the young shoots, leaves, calyx and fruit, are beset with rigid stellate hairs; stamens a little longer than the cleft petals; the filaments furnished at the apex with a tuft of erect hairs surrounding the anthers. It is a copious flower-bearer, and is common at Curcumbady, (I have since met with it two or three times.) At the same place I got specimens of *G. hirsuta?* with pubescent not tomentose leaves. I also found an *orange* in fruit only, with trifoliate leaves, whether a species or variety, I have yet to

determine: most probably the former. I made a long excursion to-day, and among other things got *Limonia acidissima* in fruit. I have been a good deal puzzled with *Tribulus*, in consequence of having met with a form, which I at first supposed a new species, afterwards the true *T. lanuginosus*, and now I suspect it is neither; that is, I have never met with a plant altogether corresponding to the character of *T. lanuginosus*, in so far as they all have four prickles to the carpels: the new ones corresponded better in that respect than the more common one, and had much more woolly leaves, but on comparing many specimens I could find no line of demarcation between them; the cocci in all have four prickles, two large, and two small, which I suspect will be equally found in the Ceylon plant, although not represented in the figure; perhaps then, they may all be referrible to *T. terrestris*, but on that point I cannot be sure, as I have never examined the genuine plant.

13*th October*.—I have re-examined these to-day, from having seen many plants of the new one; its flowers are much smaller, the second pair of prickles often wanting, and always smaller than in the common form, but they still require to be more carefully compared.

*Fagonia Mysorensis* is very common here. It is a variable plant, the stipules being longer or shorter than the leaves, the leaves 1—3-foliolate, leaflets linear lanceolate; old plants form small procumbent very ramous thorny shrubs like furze, and in this state the leaves are simple; young plants erect with the leaves all trifoliolate; in middle aged ones these are 1, 2, or 3-foliolate on the same individual. This fact leads me to suspect that *F. Arabica*, *Mysorensis*, and *Oliverii*, are all the same species.—There is a species of, I think, *Zygophyllum*, very common here, but I have never yet met with it in flower; apparently a species of *Balanites*, which has the trifoliate leaves and axillary spines of the genus, but differs from *B. Ægyptiaca*, in being a small plant in place of a tall one. I found to-day specimens not in flower of a new (?) *Solenocarpus*; it has oblong ovate, not acuminate leaflets; these

are powdery underneath. Of *Leguminosæ*, I have made a very large collection, but there is nothing that I now recollect very particular among them. My plants of the orders included in De Candolle's third and fourth volumes, are not copious, nor as yet well determined. Of *Compositæ* I have a good many, but I can give you no information regarding them through want of my herbarium specimens. I have a few good *Boragineæ*, some new ones, and abundance of a little *Cuscuta*, the first I have seen in India. To the *Asclepiadeæ* I have made some interesting additions, one of the most gratifying being *Calotropis procera*, Ham. (*C. Hamiltoni*, W. & A.) which I find abundant all about this station. There is also a species of *Tylophora*, of which there are specimens in Hamilton's herbarium, but not I believe in mine. It is a little herbaceous looking species, with a tuberous root, very pale leaves, and no branches. I forget at present the name given by him as well as that by me, but I think he calls it a *Tylophora;* plant about a foot long, procumbent, afterwards twining a little, leaves somewhat reniform at the base, ovate obtuse, glaucous when recent, much smaller towards the flower-bearing extremity; it grows among long grass on the Copper mountains near Bellary. I have a large supply of a *Periploceous* plant, perhaps a new genus, but so very like our *Toxocarpus*, that I had almost passed it as such. I am preparing some observations on the mode of impregnation of this and some other plants of the order.—To the genus *Euphorbia* I have made some interesting additions, finely characterized by the form of the petals, or petaloid scales, if you like that term better.—Among the *Gramineæ*, I have been particularly fortunate, having got many of which I had scarcely a specimen before, and I think there are some new ones; one of these is a very common and troublesome weed in the black cotton soil of this country. I have called it *Ischæmum villosum;* an account of it is in the course of preparation for publication in the *Madras Philosophical Journal*, with reference to its injurious effects on agriculture. It has immensely long creeping roots, which render it next to impos-

sible to be destroyed, when once it has established itself in a field.

On the whole, my collections since my return, may amount to between four and five hundred species, although I have been very select. I expect before I arrive at Courtallum to have a thousand or fifteen hundred. I have not met with many here yet, and do not expect many, as for want of rain the season is unfavourable to vegetation; but I discovered some pretty good ones this morning in a long and most fatiguing excursion, which kept me out till past mid-day. Among these, are a little *Linaria*, and a beautiful *Euphorbia*, a new grass like *Poa disticha*, but certainly different.—I am now preparing for an active botanizing campaign between this and Palamcottah (N. lat. 8° 42′, E. long. 77° 50′), near Courtallum; and expect in the course of it to lay in a large stock of specimens, as it is my intention in the course of the march to collect all and sundry, the better to enable me to supply specimens, and to allow me more time to *pick and choose*, when I shall visit Courtallum and the neighbouring hills. I find that I shall require to make up five or six sets for distribution in this country.

In my last, I wrote about an Indian Medical Botany for which I am collecting materials. I purpose giving outline figures of all the plants, arranged according to our *Prodromus;* the medical portion of the work is to be the joint production of the Secretary to the Medical Board and myself, and in the mean time I have been drawing up a paper on *Calotropis gigantea*, and *procera*, Ham., as a sort of pattern specimen of the intended work.

Palamcottah, *5th March*, 1835.

I have now three collectors hard at work, one here, and two in the hills about Courtallum and in Malabar. I expect from these sources many new things. I have already received some of which I had not specimens before, *Phaseolus rostratus* for example, and several others which I do not now recollect; but upon the whole my assistant here does not add much

to my stock: the other two have not returned. I have recently examined *Santalum album:* it is truly a curious plant, but I have not finished my observations through want of proper specimens; the ovule is said, even by Brown, to be pendulous, but I find it erect, at least what appears to me to be the ovule. Griffith says that it is first pendulous, and afterwards erect, by the circumcision of the apex, about which time it contracts a new adhesion, viz., by the base, thus changing its base in the course of growth; I find something like a hilum, but suspect I may be mistaken, as it is loosely attached near the end of the seed most remote from the calyx, with the radicle pointing upwards to the calyx, or inverse: the ovule has nearly the shape of a Florence flask with a long neck, attached by the thick end, while the narrow one is continued for some distance up the style. The tufts of hair (abortive petals?) opposite the stamens, and the glands of the calyx, appearing to be mere continuations of the disk, led me at first to consider this plant allied to *Rhamneæ*, but a recent examination of a *Zizyphus* upset that idea. I am now principally employed in arranging my collections and laying out specimens of all those mentioned in Ainslie's *Mat. Medica*, with the view of publishing outline figures of them with descriptions and accounts of their medical and economical properties, but arranged according to the *Prodromus*, forming in that way a medical and systematic work. I have provided two or three hundred drawings of one kind or another. I have now tracings of all Roxburgh's Coromandel plants in a portable form, and have often thought that cheap and useful editions of Rheede and Rumph might be published in that way, all arranged in systematic order. I expect to have my plants that are here assorted before my collections arrive from Madras, and shall then compare and name the whole collection for immediate distribution, at least so far as I have named specimens to guide me. If I am sent to Bengal, I fear that I shall have to intrust all my present collections to your care, even at the risk of your saying "this is rather too much of a good thing." What glorious collections we shall

have from Assam! Wallich thinks some thousands of species. A fine alpine country at the foot of the Himalayahs must be rich, but I should like above all things to have a couple of years on the Malabar range and Neelgherries. I have now a great many and interesting plants from the former, that I never saw before, nor any one else I believe, but of that anon.

PALAMCOTTAH, 18*th April,* 1835.

I find myself most comfortably situated here, and have my hands full. With respect to contemplated arrangements, my present idea is, as soon as my plants arrive from Madras, to make a packet of the whole of the *Cryptogamia*, and despatch them to you without even looking them over or taking specimens; because to do so with some of the tribes would take more time than I can spare at present, owing to the rapidity with which specimens are pouring in upon me, much faster than I can find places for them. The Tree-fern of India, or rather of the Neelgherries, is as you say, an *Alsophila:* I have since got more specimens on the Shewarey hills, at an elevation of between four and five thousand feet, nearly the same elevation as on the Neelgherries. None of these large Ferns is found on the plains, unless on the Malabar coast, which abounds with Ferns; but whether the tree-fern be among them or not, I cannot say. I received many ferns and mosses from Courtallum the other day, with a rich store of other things. I have had two collectors in that neighbourhood for more than a month, and have got several good plants from them: not the least worthy of mention are *Ancistrocladus*, (but not in fruit), a very curious *Pothos* with beautifully reticulated leaves, a *Rubiaceous* plant with a five-celled capsule, the cells many-seeded like a *Hedyotis*. There are also among them several *Compositæ;* and lots of specimens of what I suspect to be our *Gynoon*, but so covered with fruit that I could not find a flower in good enough state to enable me to determine the genus with certainty. Among the *Gramineæ* are one or two I have not yet made out; but among

those determined, are *Melica refracta*, Roxb., *Panicum montanum?* *Andropogon monandrus*, Roxb., and *A. filiformis*, Roxb. I have also several other grasses of great interest, but which I do not yet know very well myself, and therefore am not quite prepared to tell you about them; I am however busy at work upon them, even although I labour under the disadvantage of not having my books of reference or specimens to help me out in a difficult case. Among the Courtallum plants, are specimens of *Trichopodium*, a new species of *Sphærocarya* in fruit only, and two species of *Orchideæ*, that I have not before seen, and do not know. With respect to the Malabar plants, I have a noble collection; there are many at least new to me. Among these are a curious *Celastrineous** plant, with nearly a dozen superposed ovules to each cell, a new *Annonaceous* genus allied to *Miliusa*, but certainly distinct, specimens and drawings of *Zanonia*, and a *Loranthus*, with the racemes of flowers enclosed in a deep stoup-shaped involucre. (*L. lageniflorus*, W. and A., see *Hook. Ic. Plant. vol.* 3. *t.* 229, 230.) My present plan is, first to go through the grasses, and then introduce all my recent collections, numbering each species as I proceed, according to the *Prodromus* or catalogue. This I fear will take some time, as my collections are now very large, and are rapidly increasing. I really think they will not fall short of two thousand species; and, owing to the vast number of specimens, the whole forms so very bulky a concern, that I am anxious to get quit of them, in case I be ordered on a march, as one of our country carts could not contain them, a consideration of some importance, as I already require more than six carts to carry my books and *kit*, when reduced to the smallest possible dimensions; and as travelling is at all times expensive in this country, to carry about such a quantity of things would be downright ruin. Could I calculate on remaining here for a year or two, I might get on well enough; but that I can scarcely expect, as

* Afterwards noticed in the communication dated "Palamcottah, 25th July, 1836."—Ed.

it is considered an inferior appointment, and my standing in the service entitles me to look for a better, which I have no doubt of obtaining, even although I make no application. I do not recollect whether or not I had it before, but I have now obtained specimens of De Candolle's genus *Athroisma*,* and also of *Tricholepis*. A few days ago I found a new species of *Buchanania* hid under the name of *Sorindeja attenuata*, Wall., a tree from Penang, that has flourished for the first time in the Calcutta garden this year, and of which Dr Wallich has sent me a bit in a letter, along with what he considers the true *Sorindeja Madagascariensis*, but which certainly differs from the description we have given; I have not compared my specimens.

PALAMCOTTAH, 2*d June*, 1835.

For the last fortnight or three weeks I have done very little in Botany myself, but have had much tedious occupation, such as labelling all my plants, and arranging those of the first distribution (made in England as far as the end of the *Leguminosæ*) according to our *Prodromus*, which I find a great convenience in working, as I am now enabled to lay my hand on any plant I wish for in one moment. While thus engaged, I discovered a curious mistake into which we have fallen: our *Hibiscus Sidoides* is a *Melhania*; I am not yet sure about the species; it looks distinct from *M. incana*, but when compared with a number of specimens which I have, both forms, as far as regards habit, will be found to glide insensibly into one.† The little that my other engagements would permit me to do of late in Botany has been also devoted to the incorporation, into one grand series, of all the plants I have procured since my return to this country,

* The plant here alluded to is *Blepharisperum Subsessile*, DC., which in fact does not agree with the character of either genus.—ARN.

† At the time the description in the *Prodromus* was made there was only one specimen, and an imperfect one, before us, which is now in Dr Wight's possession. I have therefore no means of verifying his observations, but entertain little doubt of his accuracy.—ARN.

and no very easy task has it hitherto proved, through want of accommodations, which I delayed getting, under fear of the removal, which I formerly mentioned. That is now at an end, and I have been supplying myself with shelves, &c., which I find a vast convenience, as I can now arrange my plants in a way nearly as convenient for reference as you do in your herbarium. There are however so many of them that I fear it will take a long time to go over the whole. I name and number as I go along, a plan which I could not very conveniently adopt at first through want of proper paper; a difficulty also in the course of being removed, by my having coaxed a manufacturer to make me a kind that answers my purpose, though not the best in the world. Under these advantages I expect to move forward with much greater rapidity than hitherto, the more especially that the monsoon has now changed, and the atmosphere has become nearly 10° cooler, a point of no small importance, although even now it is rarely under 90° in the forenoon—a great drawback to application, of such continuance as is requisite when so much is to be done. I intend in the course of to-morrow or next day to go over my cryptogamic collections, and pack the whole up in order to be sent home by a ship which is to sail from the neighbouring coast in the course of this month. I will then resume the *Leguminosæ*, the order on which I am now engaged, and will try to send you a few choice specimens in the parcel of Ferns. By the same opportunity that conveys this, you will receive a copy of two little contributions of mine to the *Madras Journal of Science*, the one on *Calotropis*, the other on the *Ischæmum* or Nutth-grass, which I have since discovered to be *Spodiopogon pilosum* N. ab E., in consequence of a miserable fragment so named by him in my collection. I have notes of characters of two or three more plants which I intend to extend for the next number of the Journal, and will continue to do so from time to time, so as to endeavour to have a paper in each number: these must generally be of a character to combine the *utile* with the *dulce*, or they will not do here. I have not heard from Wallich or Griffith for a long time; I

can easily suppose that they have their hands full of business now, making ready for their Assam trip: I heartily wish them success, and feel very well contented to remain where I am, as I expect to have opportunities in the course of the next three or four months to examine with some care the Courtallum mountains, where I shall doubtless discover many fine things.

I have got a noble supply of *Holboellia ornithocephala* Hook., not from the mountains, but from the sea coast near Tuticoreen, so that those I formerly procured must have been collected near Cape Comorin: perhaps the sea-coast, Tinnevelly district, is the proper habitat. From an island off that coast I have obtained a fine new *Cassia* which is to have the honour of bearing your name. My Tuticoreen collection was most interesting though not large, supplying me with many very nice plants, some new, some old, but rare, of which I had only bad specimens, and some described in the *Prodromus*, but of which we had not specimens in our herbaria. Among the rest was *Hibiscus sidoides*, (which I have already said is a *Melhamia*) a fine *Ruppia* and a *Salsola* (true) with the winged fruit, a form which I had not before seen in this country. I have sent the collector back for more, and to try his luck again in the way of new things. My other two collectors are on the Malabar coast, from which they must return quickly, now that the west coast monsoon has begun. I expect some good plants from them as well as from the coast trip. . . . . I am fortunate in having enjoyed, and in continuing to enjoy good health, without which I could make no progress in Botany; but, notwithstanding, I get on very slowly in every thing but collecting, being subject to pains in my legs and ankles when I stand much, which is necessary in the business of arranging and handling the large parcels I have to deal with.

PALAMCOTTAH, 30*th September*, 1835.

Your letter of the 17th April, reached me some time in August, when at Courtallum, and I almost wonder how it is that it has remained so long unanswered: no time has however been

lost, and the delay has put it into my power to inform you that, in accordance with what I mentioned in a former letter, I have despatched a box to your address, filled with Cryptogamic plants, all except one parcel of good things, at least such as I think you will esteem good. Among the rest you will find specimens of both species of *Balanites.* I have now no opportunity of examining recent specimens, being several hundred miles distant from the place where the one grows, and the station of the other is unknown to me, farther than that it is not near Palamcottah. I strongly suspect that Richard is right in referring the genus to *Olacineæ*, but on this I must speak with caution, as I have not, since I discovered that he had done so, examined the plant with reference to that point, but I will soon, as I intend sending descriptions of the two species for publication in the *Madras Journal*, and some other things at the same time, for the January number. I have a short paper in the forthcoming number which I hope I shall have an opportunity of sending you. . . . . Interruptions are the order of the day: in the mean time I have been thinking of the *Belanites*, and on comparing drawings of both species with characters, I now agree with you that it is badly referred to *Olacineæ:* it seems to associate in many respects with *Cyminosma*, one of the *Rutaceæ:* the calyx is 5-parted, if not 5-sepalled, petals 5, stamens 10, torus large and fleshy, surrounded by the base of the ovary, which I think is 5-celled, style simple, short, stigma pointed, fruit drupaceous, pericarp dry and brittle, sarcocarp viscid and fleshy, nut very thick and hard, 1-celled, 1-seeded, seed pendulous, embryo and radicle superior at the apex of a large fleshy albumen. I therefore think that it rather belongs to *Rutaceæ* than to any other existing order, though it might, I believe, form a suborder of it along with *Cyminosma*, which does not associate very well in some points with *Ruta* or *Peganum*. . . . . Amongst the plants sent, you will find specimens of a *Periploceous* plant marked *Cryptolepis?* Wall: I was uncertain at the time I put it up, whether it really was so, but I have since laid my hands on a specimen from Wallich, from the Botanical Garden of Calcutta, and

find it identical; it is *C. reticulata*. When I have got my herbarium all in order I will send you a large lot of things, but when that may be I am yet unable to say. I am at present grouping the *Convolvuli*, and if in better luck than I was yesterday and to-day, hope to finish them to-morrow—not that I shall name them all, but I have every species disposed of in its proper envelope, and sufficiently well arranged to enable me readily to add either additional specimens or species, which is all that I can now do, but even in that I make slower progress than I could wish, as I deem myself fortunate if I get fifty species so brought together from two separate collections in the course of a day, and sometimes I cannot get as many done in a whole week. When these two collections are incorporated, I have, I cannot tell you how many, more to add from another series brought from Malabar, Cape Comorin, and about Tuticoreen on the east coast, and last, but certainly not least, a vast quantity from Courtallum, where I have been twice myself, and had my collectors for nearly three months. I have now sent two collectors to the Malabar coast, placing them under the observation of a friend who will afford them convenience for drying specimens which they could not otherwise have. I am also carrying on an active correspondence with Colonel Walker of Ceylon, who is soon to send me specimens of about two hundred plants collected on the highest hills of that island, among which are several European genera. I have told him that I am anxious to procure as extensive collections of Ceylon plants as possible, from the most common seed up to the rarest, and he writes me that he is endeavouring to get a man well qualified from having been long under Moon. He or rather Mrs. W. sent me a neat sketch of a new species of *Passiflora*, which I intend to publish shortly under the name of *P. Ceylonica*.* Colonel Walker has also promised me a set of tra-

* It is *P. laurifolia* L., understood to be a native of the West Indies, on which account no notice was made of it in our *Prodromus*, although Dr Wight had specimens, probably cultivated or naturalized in the Peninsula, a circumstance which he seems to have overlooked.—ARN.

cings of about thirty coloured drawings of *Orchideæ*, made by Mrs W., which, judging from two I have already received are very correct. He has also sent me a sketch of what appears to me to be a new genus of *Acanthaceæ*, but on this I cannot decide until I have seen specimens: it forms a goodly shrub, twenty feet in height, and ranges among the *Ruellieæ*. I lately looked over my *Compositæ*, and find among them several not noticed in De Candolle's paper in the "Contributions": among these are *Athanasia Indica* Roxb., found in corn fields at Bellary; a species of *Diplopappus?* not unlike *Aster Chinensis*, but the leaves are sessile, stem clasping and entire, and neither incised nor serrated: flowers rather large, pale yellow. I have been sadly puzzled between *Glossocardia* and *Glossogyne*, owing I suspect to Cassini and Lessing having drawn their characters from different species, and Roxburgh's characters are here too short to be of much use. I am very anxious to see Nees publish on the *Gramineæ*, for I wish to put mine in order, and would like when about it, to do it well, and make myself master of the subject, which I find no easy matter from Kunth's *Enumeratio*. Nees has perhaps multiplied genera to excess, but Kunth has certainly fallen into the opposite error, and left the whole of the large genera in confusion. But to return,—I have some other *Compositæ*, not included in the "contributions," but which I do not recollect well enough to designate at present. I have added to the Peninsular Flora the *Leptadenia imberbis?* from the ceded districts: a twining plant, not unlike the *L. reticulata*, but not so pale and pulverulent, and it appears altogether a smaller shrub. The bark is not corky. The *Tylophora* which I found at Bellary is the *T. fasciculata:* I again found it at Courtallum.

Lest I should afterwards forget, I may here mention that our *Sphærocarya*, and I dare say Wallich's (of which there is a figure in the *Tent. Fl. Nepaul.*), is certainly Gærtner's *Hyophorbe;* and Hooker's *Pyrenacantha* appears to be a smooth fruited species of Gærtner's *Granadilla Hondala*. I send

fruit of another from Courtallum; they certainly agree in having interior processes to the shell of the fruit which is a rare and curious character.

1*st October*.—I have told you that I have been twice at Courtallum, and must now say something about my acquisitions there, premising however that I have not yet got all home, and that, of those that I have got, there are three large parcels still unopened. I hope Greville will give you some information regarding my doings there, as I wrote him a long letter on the subject, which I requested him to show you, and even to publish in Hooker's *Companion to the Botanical Magazine*, if thought worthy as an illustration of Indian Botany.*

From that you will see that I have discovered several fine *Annonaceæ*, I do not yet know how many, but I believe there may be as many as all I had before; and no doubt there are many more there if I could only revisit the place and search for them. There are also many new species of *Balsamineæ;* one so remarkable, that I intend constituting of it a genus in an early number of the *Madras Journal*. I have a species of *Argostemma*, Wall. (*Court. Coll. n.* 75), very like his *A. verticillaris*, but tetrandrous. I have also another tetrandrous plant (*Court. Coll. n.* 756) of the same order, nearly allied, but differing much in habit; that genus I sometimes think, is allied to *Campanulaceæ*, near *Wahlenbergia*, a species of which with blue flowers like the St Helena one, I have also got on these hills. Another very desirable addition to the Flora is a species of *Aikinia*, differing very slightly in its generic character from the original species; neither the sterile nor fertile anthers are forked as in it, although in other respects it agrees, as well as in habit; it was unfortunately not in fruit. Of *Didymocarpus* or *Cyrtandra* (I forget at present the difference) there are I think four species, besides one or two other plants of the same order. I have two species of *Æginetia*, one *A. pedunculata;*

* It is there published, Vol. i. p. 327.

the other a very curious one, quite sessile, and the flowers covered outside with a very thick coating of mucilage, which renders it difficult of preservation. I have a *Blackwellia* (*Court. Coll. n.* 734), but I have not yet ascertained the species. There was a species of *Pothos*, nearly as big as *P. caudata* of Wallich, *Pl. Rar. As.*; perhaps it is *P. pertusa*, but I had neither Rheede nor Roxburgh to compare it with at the time, and I have not since examined it; it is a very large species, creeping on the ground, and found in very moist shady places. My collection of *Orchideæ* is very rich, that is, compared with what I have hitherto seen in this country, and it might have been much better, could I have extended my excursions or remained longer there, as there were many not yet in flower. The *Euphorbiaceæ* are very abundant; some new genera I have already ascertained, but most of these remain yet to be examined. *Leguminosæ* form a small portion of the collection, owing to the season not having been sufficiently advanced, but I am not without hopes of improving this department in a month or two, as I recognised many not yet in flower. *Pycnospora* I found in abundance on the grassy parts of the hills, always in turf-soil. *Rubiaceæ* are very abundant, and I have met with several new ones, or at least species not considered as entitled to a place in our *Prodromus*. I have collected plenty of *Lagerstrœmia parviflora*, a most beautiful tree when in flower, also of *Salacia oblonga*, both in flowers and fruit; the fruit is nearly as large as a good-sized apple, and contains several seeds; the plant is a considerable shrub, or even small tree. There was a very distinct species of *Ternstroemia*, and a very curious *Sapindaceous* plant (*Court. Coll. n.* 736), which at first I thought might be a *Salacia*, from the form of the fruit. *Ancistrocladus* is really abundant on the hills, and *Hiptage madablota* on the plains; *H. parvifolia* I have also got, but did not gather it myself. The calyx of *Ancistrocladus* I find to grow with the fruit, like that of the *Dipterocarpeæ*, but I have not yet had an opportunity of examining the fruit when recent. I expect however, you will find good

specimens among what I have sent you. I have a new species (to us) of *Aurantiaceæ*, the genus not yet made out; the fruit is still a desideratum; also a splendid *Phoberos*, which I have not yet ascertained whether or not it be new, by a comparison of specimens; it forms a large tree. I have procured more *Scitamineæ*, than I had done in all my life before, but certainly not all, nor nearly all that grow in these hills; it is a tribe with which I am little acquainted. *Aroideæ* are abundant, and most of them are new to me. Of *Gramineæ* I have found a few good species, and of *Cyperaceæ*, several new, among which are some very distinct *Carices*. I have collected a good many *Ferns* of different kinds, a few *Mosses* and other *Cryptogamia*, among which is a curious *Phallus*.

*Nov.* 15.—Before the time arrived for the despatch of this letter, I was informed that a ship was hourly expected at Tuticoreen, and that the merchant who had engaged her would be happy to send home any thing I might wish, but that I must only calculate on ten days to get my packet ready. Fortunately for you, more than twice ten have elapsed; for I at once determined to send you if I could possibly accomplish it, a complete set of my Courtallum plants, although at the time there were some hundreds not arranged. I set to work without delay, but before I got the arrangement completed, I was laid up from the fatigues of standing so long as six or eight hours daily. I have consequently not been able to complete my packet which might have extended to nearly 1500 species; by to-morrow, however, I shall have put up between seven and eight hundred, and probably as many thousand specimens. These will fill a large box; under the circumstances mentioned you cannot expect either names or remarks; the specimens are simply numbered, not that I did not know many or even most of them, but because I felt that more time would be required than I could afford to give, and because I knew that to you it was not necessary. You will occasionally find the same plant mentioned twice, on account of slight variations of form; and lest on examination,

they should prove distinct. I hope to send you the series down to *Euphorbiaceæ;* but these are so numerous, and as yet all in confusion, that I must stop there for a day or two, but will immediately after resume the business and hope to have a second remittance, bringing the series to a conclusion by the first ships of next season. I will not lose an hour that I can save, as I heard about a month ago, that there is a probability of my being employed to make a Botanical survey of the Neelgherries and some high hills in the neighbourhood, and I am in almost daily expectation of receiving the order, although I cannot say that my hopes of its arriving are very sanguine. If I do not obtain it, I intend forthwith to make application for a garrison appointment, in which I am more likely to succeed, and shall then set myself down to enjoy as much of the *otium* of a stationary appointment as my professional duties will permit. I wish something of the kind would turn up, for I am tired of my present uncertain kind of life, and I can never feel sure but that the next post will bring me an order to hold myself in readiness for a march, on which account, I cannot supply myself with those comforts and conveniences which are so essential to a domestic character like me, who never wishes to go from home; jovial society has no charms for me, and such is the usual kind of society in this country. I have for some time back occupied myself during the evenings in writing papers for the *Madras Journal*, and letters for one of our newspapers on the advantages likely to accrue to the country from the Government encouraging the diffusion of science among its servants. One has been published, the second will be so in the course of a week, the third is brewing in my *brains*, and the subject of the fourth is determined on. This freak originated in the disgust I feel for the eternal frivolous conversation about hunting, shooting, dogs, horses, &c., to which I am exposed in the limited society of this place. I received this evening the first remittance from my Malabar collectors, and have looked over part. On opening the parcel, I was quite horror-struck at finding it soaking wet, owing to heavy rains which

have been falling for several days. My horror was not lessened on finding the first plant to be the worthless *Cissampelos convolvulacea.* These were bad omens, but as I proceeded, I found that the wet had not penetrated deep, and that among the plants there were really some good things, perhaps not quite so many as I anticipated; but then I believe I expected more than I had a right to, considering how many I had already received from a country so near that from which they came. I wish that I could devote a couple of months to the Courtallum mountains now, that is, when the rains are somewhat over. I am strongly impressed with the idea that the Flora amounts to at least two thousand species; indeed I may say I am quite sure of it, for I have already obtained half that number, although but a small portion only of the hills has been gone over: the whole space does not exceed ten miles in length, and at the very utmost two in depth, showing an extraordinary fertility and variety of distinct forms. When I have gone over and numbered the whole of the collection, I intend to send a second article for publication on the subject, in which I will dilate on this fertility, calling the attention of the people in power to a circumstance so remarkable, and urging the propriety of having the country adequately explored. I *have* done so in some degree in my first two papers, and in the second I give more details than I could venture on in the first. M. Delessert has been so kind as send me the first volume of the *Flore de Senegambie.* In it I perceive that *Reidleia corchorifolia,* has been replaced in *Melochia;* the anthers of that plant are most peculiar, and well worth your examination, particularly before the flower-bud opens; I suspect it will be found when compared with other *Melochias* to be quite a distinct genus, but it is one of those common plants that nobody thinks of examining carefully.

*November* 16*th.*—My despatch is completed, the box made, and all but ready to be filled to-morrow; the ship sails the end of the week, so that there is no time now to be lost. I have looked over the *Flore de Senegambie* again in a very

cursory way, and feel quite satisfied that we could reduce the number of new species, if we only had the specimens to compare with ours. Thus *Cocculus Dakis* looks too like our *C. cordifolia*, *Cissampelos mucronata*, hardly a variety of *C. convolvulacea*, *Triumphetta pentandra*, resembles our *T. angulata* so much that if I saw it growing in this country I should pass it as such. I shall attend more to the varieties of that plant. *Heudelotia Africana*, belongs probably to the same genus as our *Protium Gileadense*, and is I suspect a native of India, at least I found a large shrub, very like it, near Bellary. *Dalbergia melanoxylon* seems neither more nor less than our *D. frondosa*. I have had another letter from Ceylon from Col. Walker, with more tracings of *Orchideæ;* some time ago I received some dried plants from him, and others have reached Tuticoreen, for which I will send when I dismiss your box.

*November* 17*th*.—I have sent you several little sketches of generic characters, &c.; they are all numbered to correspond with the plants to which they belong. You have to thank Veragoo, my factotum, *alias* butler, for many of the odds and ends at the top of the box; my time was up when that part of the business was in progress, but I know enough to have reason to think you will stare when you see them. Runzie (my draughtsman) "sends compliments, and hopes master will think drawings very good."

PALAMCOTTAH, 27*th November*, 1835.

I have been for some days past devoting all my spare time to Col. Walker's plants, and have found some very interesting ones among them. There are some duplicates which I will send you by the next opportunity, along with the remainder of the Courtallum plants. I had a letter a few days ago from Griffith and Wallich, they are making great progress in collecting, the whole party are in good health, but getting into the midst of the rainy season. Griffith had found a new *Chamærops*, the height of the plant was fifteen feet. I forgot to tell you in my last that there is a work on

the Flora of the Neelgherries, commenced by Professor Zenker of Jena, in folio, with coloured plates. He seems to have considered every species to be new, and made a new genus out of the *Abelmoschus angulosus*, under the name of *Hymenocalyx variabilis; Fragaria Indica*, is there called *F. Nilagirica;* for *Passiflora Leschenaultiana*, the Professor retains its old name. There are two species of *Jasminum* with new names, although I feel almost sure they are both old plants, and doubtfully distinct when their characters are compared, although certainly they look very different. *Parnassia Wightiana*, in his hands becomes *P. Schmidtii*, and *Urtica heterophylla; U. acerifolia*. There are two species of *Ferns*, both in my herbarium, and I think both old species; these are decorated with names of *Aspidium anamiphyllum*, and *Grammitis cuspidata* of Zenker. Such is a specimen of the naming of the first decade; in other respects the work appears so well executed, that I requested the Professor's friend in this country, who supplies the materials, to suggest to him the propriety of sending you in future proofs of his plates before naming them, on the ground that you must be acquainted with the Peninsular Flora generally, and the Neelgherry one in particular, better than any other man in Europe, as my herbarium contains probably a greater number of species from that region than any other. I hope for the sake of science that he will adopt the suggestion. I feel surprised that no one in these days of system-writing, has thought of undertaking a "*Genera Plantarum*,"* according to the Natural System; I know no book more wanted, particularly if printed in small type, so as to make it a work of easy carriage and convenient reference. The species have now become so numerous, that it is impossible to give another synopsis like Persoon's, although two thick octavos printed in similar type would go far towards its accomplishment, and

* Such a work is now happily nearly completed by Stephen Endlicher, under the title of *Genera Plantarum secundum ordines Naturales disposita.*

such a volume as Persoon's second, might easily hold the character of the genera and even of the orders, if the genera were given in an abridged form.

PALAMCOTTAH, 1*st January*, 1836.

Along with this I send the last packet of plants which I shall have it in my power to forward probably for a long time; it contains the concluding part of my Courtallum collection, and a very few other things which I know you will consider *good*. Peace and quiet have never been my lot, and I see no prospect of its soon falling to my share. I am now preparing to commence a roving life, of what duration it is not easy to foresee, having been recently called upon to embark in a most comprehensive course of inquiry, embracing the investigation of all the useful or likely to be useful vegetable products of the peninsula, and more especially the means of improving the culture of those fitted to afford articles of exportable value, such as cotton, tobacco, sugar, dyes, medicinal drugs, &c. I expect to make my first march in about a fortnight, directing my steps towards the Malabar coast, with the view of gaining information about the cultivation and commercial value of cinnamon, and examining the kinds and qualities of timber produced on that coast, and ascertaining the species that produce the best kinds. From that I return by Courtallum, examining in my way, and reporting upon the spice gardens as they are called, and the capabilities of the country for the production of tobacco fitted for the European market. In the course of this little excursion, which will not, I presume, occupy more than a month or six weeks altogether, I expect to get *some* very interesting additions to my herbarium, but not very many, as that must only form with me a secondary object; that, however, shall not be lost sight of, as I have two well trained collectors whom I shall take care to keep employed. My after peregrinations must be partly on the low grounds, partly on the hills; the more of the latter the better, as being most congenial to my taste, and being least known to the community,

will afford me the best opportunities of making good reports on these parts of the country. I have no idea how long this office is likely to last; but if it extends to a year or two, I hope to be able to do some good to the country, and not the less from having the immediate ear of the government in place of sending my reports through revenue boards and such like impediments to improvement, by which our system is beset in all directions, and the ears of government kept close to every suggested improvement, that does not come before it with the recommendation of these mar-goods, and many is the good suggestion that is strangled in the passage through these boards, of which the government never hears a syllable. Such are my present hopes and prospects, and God grant they may be crowned with success.

QUILON, 14*th June,* 1836.

In my last letter I mentioned that I had been called to fill a new appointment. I have since been told that it is a temporary one, only to last *one* year. About the beginning of March, in the course of a tour, I arrived a second time at Courtallum, and remained there ten or fifteen days. In that time I collected many plants, and among them several new ones; but unfortunately before I had time to visit the best parts of the hills, I was regularly floored by a severe attack of jungle fever, which compelled me to quit the place without delay. The circumstances attending it were peculiar. I and a party exceeding twenty persons, had been there some time, the weather fine, the climate delightful, and the course of the wind about N., or N.N.E.; it changed to S.S.E., or South, and in one night the whole party were more or less complaining. We remained two or three days unsuspicious of the enemy we had to deal with, and then we were scarcely able to get away, every one of us being attacked. My share was so severe that some of my Palamcottah friends predicted that it would be my last attack; I hope they may prove true prophets. A good constitution, however, and judicious treatment, soon enabled me to subdue the enemy; not so the

natives; they were all slow of recovery, and one of the strongest men of the party is still an invalid. I took advantage of the circumstance to visit Ceylon for a few weeks for change of air, and was fortunate enough to return as stout and well as I ever was, and have so continued ever since.

In the course of my residence in Ceylon, I made a fine excursion with Col. Walker, and succeeded in forming a good collection of plants; take it all in all it would have been much better had my collectors been in firmer health, and my conveniences greater than they were for preserving what I got, but be that as it may, I believe I may have between five and six hundred species, perhaps more: a pretty complete set of which you may depend on receiving as soon as I can find time to look them over. Among those I have examined, (which of course were not many, during the hurry and bustle of the trip,) we found the types of two new ? orders: one near the *Annonaceæ*, between it and *Magnoliaceæ:* the other near *Lytideæ:* the first differs in having a copious but not ruminated albumen and some other points: the other (*Pouslowia*, mihi,) is remarkable for having two or three series of involucral leaves finely coloured, and resembling petals, but surely not petals, as they are alternate, not verticillate. (see p. 192). I have since found it on this (Malabar) coast, or one so like it, that I have not been able to distinguish the two by habit and foliage: the coast plant is not in flower. On my return from Ceylon my first business was to write a long report for government in connexion with my present appointment, and then I set off on an excursion to this coast, where I have been fortunate in getting several plants which I had not formerly in my collections: these are daily increasing, notwithstanding the present rainy weather. I have a *Salomonia*, a *Scævola*, (*S. Taccada*, Roxb.), a *Sagittaria* (apparently *S. cordifolia* Roxb., but differs in having the posterior lobes of the leaves quite round, not unlike smaller sized leaves of *Nymphæa cærulea*,) a species of *Nymphæa*, (with very small white flowers smaller

than in *N. cærulea*, but with large leaves like those of *N. rubra*, and like them of a dark brownish purple on the under surface;) a species, I think new, of *Loranthus* with very slender flowers tapering to a long point during æstivation, but revolute after expansion, a very pretty species of *Keempfæria*, (perhaps *K. Galanga*, Roxb.,) also *Alpinia Galanga*, Roxb., a fine *Vanilla* (*V. aphylla* of Walker,) first discovered by Col. Walker in Ceylon, but of this I only found one flowering specimen from which I had a drawing made. Did I send you specimens of a *Scævola* from Tuticoreen coast? which I presume is *S. oppositifolia*, Roxb. I have now got specimens of *Sonneratia acida*, not very like Lamark's figure; I observed a new apetalous species in Ceylon, but unfortunately did not procure specimens. In the course of a few days, that is, as soon as the weather will permit, (it is now very bad) I start on an excursion into the interior which may perhaps end in my crossing the hills to Courtallum, that being a near cut home, but at present not a safe one, on account of the unhealthy season, and also on account of a man-eating, *alias philanthropic* tiger, which infests that road,—both bad in their way, but the first upon the whole the worst. My next excursion is to the Pulney hills, about seven thousand feet high, where I expect many fine things, as I hope to protract my stay at least a month. At intervals, as I could make time and inclination combine, I have written papers for the Journal on the Courtallum Flora; the first and second were dilatations of the one Hooker has published; the third and fourth contain some further remarks on the comparative and general amount of the Indian Flora, followed by remarks on some of the orders, something after the manner of Royle's work: these seem to take, as I have recently received letters from several strangers who are disposed to commence studying Botany, and they will therefore be continued. I hope I shall improve as I go on. I have also promised the editor figures and descriptions of new and interesting plants: but this is not quite so easy a task, as I experience much difficulty in determining my plants accurately from want of

books of reference; but as figures are to be given, less harm will be done if I go wrong. Of the plants which you write me to procure for you, *Epithynia*, and its twin-brother in appearance *Lumnitzera*, I have not yet seen either, except at one place in Ceylon, and then I had no means of preserving a single specimen: of *Carallia* I have specimens I believe from Courtallum, but at all events I found some young flower-buds yesterday. I have found two or three *Rhizophoreæ* since I came here. I mentioned to you that I had all Roxburgh's *Coromandel* plants (with the exception of one or two that seem to have been accidentally omitted,) copied or traced: I have got the same done with Wallich's *Plant. Asiat. Rar.*, and intend to have also his *Tentamen Fl. Nepalensis* done by and by. These being all arranged, are very convenient for reference; they form only two moderate volumes and are easily carried about. I almost incline to employ a person, if I can get one, to trace the *Hortus Malabaricus*, for the sake of arranging the plates in a mode suitable for being consulted, which they are not now. Wallich has returned from the Assam trip, but not Griffith: the latter in his last letter remarks—" I don't think I have any thing new to tell you, except that the hard part of the fruit of *Cocculus* (I mean) *Cissampelos* is a *pyrena* not a *putamen. i. e.*, it is *testa* not *endocarpium*. This you may rely on, as also, that it is the only case in which the placental suture is anticous." Again he says, " Only fancy, I have been dabbling in *Compositæ* and am prepared to prove that the fruit is not an achenium (*Cypsela, Lindl.;*) neither is that the testa which encloses immediately the embryo; the true testa is in almost every instance I have examined adherent to the ovarium." I do not know the value of this piece of anatomy, not having yet had an opportunity of repeating the dissections; but if you find it important, and if he is right, (and this is the first explanation given of the true structure,) give him the credit which he deserves. So far as I am acquainted with the subject I do not see what is to be gained by the discovery, supposing it to be one; but others may think differently,

and I therefore give you all the information I have regarding it.

21*st June*.—Since writing the above, I have had the benefit of a day's excursion to the salt-water swamps in this neighbourhood; I was rather successful. I got two species of *Rhizophora*, one new, distinguished by having the flowers sessile all along the peduncles like figs, and by the form of the leaves: several species of *Bruguieria*; *B. gymnorrhiza*, and I think four others; there are two species I suspect confounded by us under *B. gymnorrhiza*, one with glabrous petals except a few bristles at their points, the other with them densely ciliate or "woolly along the margin:" perhaps *B. cylindrica* is one of the others, but I am uncertain, as I have not yet compared Rheede's figure; it seems to me to differ by the number of flowers; the remaining two differ by having what may be called umbels (pendulous) of flowers 2-3-chotomous; probably they are not *inter se* distinct, as their principal difference consists in the form of the leaves, which may arise from luxuriance or some local cause: they present however a very different appearance when growing side by side. Our generic character of *Bruguiera* must be amended: add "stamens expanding at maturity with elasticity and scattering the pollen of the enclosed anthers," and delete "woolly along the margin;" add after anthers "ovate," those of the new species being decidedly so. I found no *Carallia*, but abundance of *Lumnitzera*, and also a *Sonneratia* which seems different from *S. acida*. I met with a new species of *Dilivaria* with hastate leaves, the broad base and points only being prickly; the calyx is 4-lobed or sepaled and with three bracteas; it grows in rocky soil, banks of the Back-water near the Residency, Quilon; the roots were in the water. I obtained a species of *Dalbergia* with short lunulate pods, less than an inch long, but I do not yet know if it be a described species. Some days ago I found a *Utricularia* very like *U. vulgaris*; perhaps it may be *U. flexuosa*, Vahl, or *fasciculata*, Roxb., but it wants the "horns" to the utriculi: at the same time I detected a *Villarsia* allied to *V. cristata*, but with excessively

minute flowers and naked petals, whence, if new, I propose to call it *V. micrantha.*

PALAMCOTTAH, 22*d July*, 1836.

When I came here from Quilon, whence I last wrote to you, I resolved to devote a week to putting up for you a set of all my recent collections. Owing to their number, and other circumstances, I have found two weeks scarcely sufficient, and this without adding generic names or notes, further than the place where, and time when gathered. I expected, and certainly ought to have been, at least fifty miles from this now, whereas in my anxiety to place within your reach as large a mass of materials as possible for our second volume of the *Prodromus,* I am still here, and must be some three or four days longer, before I can get under way The present despatch, exclusive of Ferns and uniques amounts to 1355 numbers: the whole is arranged in natural orders according to your own paper in the *Encyclopædia Britannica,* which will save you some time. Owing to bad weather for drying, deficient supplies of paper, and, still more, the sickly state of my collectors who were unable to work, my Ceylon plants have not turned out nearly so well as I could have wished. You will notwithstanding find some good things among them, and it is probable that Col. Walker, now that he has seen my mode of collecting, will do as much in one year as he has hitherto done altogether. He writes me that he had sent a large despatch to Graham, with instructions to contribute as largely as possible to you; if they be numbered, send him as speedily as you can, a list of those you get, as he now wishes to form an herbarium of named plants, and is especially desirous of having his Ceylon ones named. . . . . . . .

And now you may congratulate yourself that you will have no more trouble from me in the plant way for a long time to come, which I can easily imagine you are happy to hear, after the unmerciful transmissions of the last twelve months, amounting, as I believe they do, to upwards of two thousand species of Phanerogamous plants. Large however

as these are, I have still to regret that they do not form a complete series, and still more so that it is utterly impossible for me to do more now than send you a few selections of such as I believe you have not formerly received. Within four days from this date I hope to be fairly under canvas (in tents,) there to remain during at least four months, perhaps more. In the course of that time I expect to visit much interesting country, and get abundance of fine plants; but as I know not what is to become of me afterwards, I cannot say when you are likely to reap the benefit. You will find by the present *envoi* that I have at length discovered the genus *Humboldtia* in the Peninsula. I am uncertain whether two or only one species: neither is in flower, and one only in fruit; it is a magnificent tree, and if, as I think, it be new, I intend to associate your name with it. The other, of which there are only leaves, appears to be different, and more like *H. Brunonis*, Wall. Do not suppose that the one in fruit (*H. Arnottiana*, mihi) is not furnished with the peculiar stipules because they are not on the specimens, for in truth it was by them that I first recognised the tree. On the same day, but on the Courtallum side of the hills, I found the *Trichopodium* in abundance; you will receive specimens of it, as well as of another which I got in Ceylon. There appeared to be several species of that genus, as well as of *Acrotrema:* of this last those which I saw in Col. Walker's possession differ from mine, found both at Courtallum and in Malabar. Col. Walker says he sent specimens to Graham.

*24th July.*—When looking out specimens of some species of *Polycarpæa* to-day, I was led to re-examine all the genus, as far as regards India; and, in doing so, saw reason to think that our two species are only one, or if they be kept distinct, that other characters must be found for them. I have accordingly united them under the name of *P. polymorpha*, and have added three new species: two of them are I think really good; the third, *P. aurea*, I have doubts about, as its character principally depends on the colour of the sepals. I propose to distinguish them by the relative size of the petals

and sepals. In *P. laxa* they are nearly equal: in *P. spicata* the petals are minute and subulate: in *P. aurea* about half the length of the calyx, obtuse, and as long as the capsule: in *P. corymbosa* and *P. spadicea* they are as in *P. aurea;* I thought at first that I could distinguish these two by the relative length of the petals and capsule, but further examination shows these proportions to vary in different flowers, and to depend on their stages of growth, and I have found no other fixed characters. I send you specimens of four forms, and perhaps my *P. aurea* ought to form a fifth, as its mark of distinction consists only in colour. *Hapalosia* is too much allied to *Polycarpæa:* the only difference being in the number of stamens, 3 *versus* 5: the capsule and attachment of the seeds are the same in both genera; that is, they are fixed by podosperms to the bottom of the capsule, and not to a raised placenta.

25*th July.*—I have been half this morning examining and describing the *Celastrineous* plant which I formerly mentioned to you (see p. 169,) as remarkable for having several superposed ovules; I consider it a new genus, and shall send you specimens, and perhaps a drawing of it: it approaches *Elæodendron* in having opposite leaves and a large discoid torus, but is yet very different; I have called it *Lophopetalum* on account of the curious crest with which its petals are ornamented.* . . . . In the present despatch you will find a considerable number of *Scitamineæ.* I am truly sorry that the flowers are not better preserved; I never before had to do with them to any extent, and did not know the difficulties attending their management: in future I shall endeavour to determine their genera before drying them, and, when I can, the species also, as they are troublesome things to examine afterwards. The *Commelineæ* is another tribe that has annoyed me not a little, and I presume might be treated in the same way. When among the *Scitamineæ,* which abound in Malabar, I had not with me any book except Persoon, to

* To this n. gen. belongs *Euonymus grandiflorus,* Wall. or *E. lucidus, Don.*—Arn.

make them out by, and that work is long out of date: I fear therefore that you must draw largely on Roxburgh, and not confine yourself to his peninsular species, as he never visited those parts of the Peninsula where they abound. In Malabar, as I have already said, they hold a very conspicuous place, if not for the number of *species*, certainly for the number of *plants*, the ground being absolutely covered with them. . . . . In the packet you will find a new genus of *Leguminosæ*, which I found at Courtallum; I have called it *Acrocarpus*

I have sent you the generic character of the genus *Pouslowia*, which I formerly mentioned, (see page 185.) but I have omitted to say, that the apparent petals and sepals are only bracteæ, as they alternate and are not verticillate: they are herbaceous below and petaloid above, so as to resemble their organs, and no doubt but they perform their functions. I had a letter from Dr Wallich, two days ago, since his return from Assam; he speaks in magnificent terms of their collections, and of the vast qualifications of Griffith, as well as of his unconquerable application. Griffith is undoubtedly all that Wallich describes him. . . . . . The long journey on which I am now about to start, will occupy me at least four or five months; in the course of which I expect to travel over nearly 1000 miles, visiting in my course the highest hills in southern India, viz., 1st. The Shevagurry, between 5000 and 6000 feet, at least I presume so, from the top being covered with a fine grassy sward, and being reported by the natives as intensely cold. 2d. The Pulney hills, said to exceed 7000 feet. 3d. The Shewarries, between 5000 and 6000 feet. And lastly, the Neelgherries, above 8000 feet. From these last, I pass through Coorg, a country unexplored by naturalists, and descend to Malabar about Cannanore; thence I pursue my route homewards along the coast. In the course of this journey, I shall no doubt gather a harvest of natural curiosities, but I have other duties to perform, which must considerably limit my exertions in the cause of Botany.

PALAMCOTTAH, 3*d August*, 1836.

A few days ago, I despatched a long letter to you, *viâ* Madras, informing you of a large box of plants, which I was on the eve of sending you. They are now at Tuticoreen, and the vessel is expected to sail so soon, that it appears not improbable they may leave the coast before the letter; to make sure then of your getting due warning, I now write you a few hurried lines to go along with them. I have at length got all ready, and make my first march to-morrow, or at least the day after. I had a letter from Graham the other day, in which he tells me about his Gamboge inquiry. (See Hooker's "Companion," vol. ii. p. 379.) I also have been induced to examine the subject, and have drawn up a little paper for publication in the *Madras Journal*, stating the results I have come to. They are soon related.

1. Graham's plant, which ever has produced, and does now produce, *all* the Gamboge of Ceylon, is an *exotic;* or if a native, we have as yet no evidence to that effect, and the tree is very rare. It is more than probable that it is identical with *Garcinia pictoria*, Roxb., but if not, the two are of the same genus. I conclude the paper by an examination of the *Garcinieæ*, and suggest the division of the genus *Garcinia* into four genera, or subgenera. *Stalagmites*, after a careful study of Schreber's character, I have reduced to *Xanthochymus*, Roxb., by substituting five for four in the proportion of the parts of the flower, which renders it symmetrical, like *Xanthochymus;* indeed his description of the stamens "in 5 phalanges connata," is quite sufficient to settle the point, especially when we add to that a three-seeded fruit: all the *Garcinieæ* having an even number. I propose to form the Mangosteen, G. *speciosa*, Wall., and *G. cornea*, Roxb., into one genus, on account of the stamens being united into cohorts or masses, that is 4-delphous. *G. Cambogia* forms another from having the stamens of the male flower in a single row around the central receptacle. *G. Ceylonica*, *Kydia*, *paniculata*, *pedunculata*, and *affinis*, W. & A., form a third, having the stamens of the male flower united into a capitulum; and

finally *G. pictoria*, Roxb., *G. elliptica*, Wall., and *G. Morella*, form the fourth, on account of the united stamens and one-celled circumscissile anthers. For these, I have proposed the names *Mangostana*, *Garcinia*, *Cambogia*, and *Stalagmites*, I apply this last to Dr Graham's plant, the true Gamboge bearer, rather than to make room for it by abolishing *Xanthochymus*, a well established genus.*

We have lately got a new editor for the Journal, and he is making great efforts to raise its character from the lowest to the highest grade of periodical literature, and there is reason to believe he will succeed to a great extent. As I was myself an instigator to the change, I feel myself in some measure called upon to support the work to the utmost of my power, and shall, therefore, publish, whatever I write, in it, in the first instance. Griffith has also promised communications on Botany, while the editor will extract from the Calcutta and Bombay periodicals, whatever appears in them worth insertion. You may, therefore, expect to find in it a nearly perfect record of the progress of Indian Botany. When new genera or species are published in it, it may be useful to get them transferred to some of the European periodicals to prevent their being lost, or superseded by writers in better known and more widely circulating journals: the last number has 240 pages of matter, principally, if not indeed entirely, Asiatic, and for the most part strictly scientific.

PULNEY MOUNTAINS, (elevation 5500 feet above the sea,)
*27th September*, 1836.

I HAVE now been on these rather elevated regions the better part of three weeks, and owing to bad weather and confinement to the house, have blotted not a few sheets of paper; yet I do not, I assure you, grudge the trouble of filling up one for you. . . . . I hope you have written to Col. Walker, as I advised you, and before yours can arrive, he

* Dr Graham has called the Gamboge plant *Hebraiodendron*, and seems inclined to bestow *Stalagmites*, as the oldest name, on *Xanthochymus*.—ARN.

shall have a preparatory letter from me. He wishes to see his plants published, and as you are the only English Botanist likely to do so for sometime, he has told Graham, whilst sending his last collection, to send you a good set; in my next however, I intend to tell him, that if he wishes you to name or describe his plants, he ought to send you those for your examination in a direct manner. In my last, written immediately before I started on my present tour, I told you that I had taken up the subject of the *Garcinieæ:* that paper will be published in a few days. I have since written another on the *Balsamineæ*, describing about fourteen or fifteen new species, all those of which I send you sketches of the flowers from Courtallum, six others from Shevagurry hills, and two from the Pulneys. I have now seen ample reason for believing my proposed genus *Koupathea*, is only a queer Balsam, which I have denominated *Impatiens auriculata;* it may, however, be published under that of *I. alata*, if the letter containing the former does not reach the editor in time to make the alteration. I have also sent to the same journal a third memoir, but of a totally different description. These may or may not reach you, but I have desired the editor to forward to you through Allen & Co., ten copies of each of my botanical papers, in order that you may distribute them in the manner you think most appropriate. Since I came here, I have had an application from a new Madras Society, (the Madras Agricultural and Horticultural Society,) for communications, with which I have complied. As what I wrote was knocked off in a couple of days, amidst a variety of interruptions, you will readily suppose that it partakes largely of the off-hand character. I presume that it will be printed, and you shall have a spare copy if I can get one. While the iron was hot, I wrote a second one for the Calcutta Society, of the same name, but of a different description; that society has recently paid me the compliment of presenting me (although not a member,) with a copy of its transactions, I therefore feel in honour bound, when any thing good comes in the way, to make it the subject of a communication. An appro-

priate one presented itself while perusing the last part of their transactions. In it two sets of experiments are detailed; the first by the excellent old M. Anderson, Curator of the Apothecary Garden, Chelsea, upon some Rice, the produce of the snowy tops of the Himalaya mountains, and from all accounts one of the most hardy of all the varieties of the *Cerealia*. This proved with him so tender and tropical in its nature, that the summer heat of England was too cold for it; but as he sprouted it in a hot-house, kept it till half grown in a green-house, and then turned it out, only to *become* hardy after the previous *tenderification*—it died, as was to be expected, under the freezing nights of September; he infers from this that England is too cold for Rice, and a committee of the Society of Arts think the same. A Calcutta gentleman, on the other hand, had been long baffled in all his attempts to raise a crop of celery, in the way usually adopted in this country, by sprouting it in a cool shady place; but having got a hot-bed made, he sprouted the seeds on it, and these, when planted out, succeeded far beyond his or any other person's expectation. The object of my paper was to reduce these apparent contradictory experiments to general principles, that could be explained by the laws of vegetable life, by showing that Anderson had changed the hardy plants into tropical ones, and that the other had merely done the same; that consequently the one failed because the seeds were raised in a cold climate, and the other succeeded because they were reared in a hot one. The facts present a most cheering prospect to tropical agriculture, since they demonstrate that heat applied to the seed in germination conferred on the plants a tropical property, which, if it was communicated to its offspring, there was reason to hope that we might be able in the course of two or three generations to produce a permanent change from hardy to tropical, and thus enable us to introduce into general cultivation in India, all manner of European plants. Such is the cream of my paper. If Wallich gets me a few spare copies, I shall send you one, as I trust it will amuse if not enlighten

you. I am now partly working, partly meditating on a report for government, on the hills from whence I write, and on this I must bestow considerable pains, as I had to-day a letter informing me that "the Governor in Council had perused with much interest my letter of the 16th ult., containing the result of *my recent tour on a range of mountains* near Shevagurry." From all this, added to a long report, (twelve sheets,) *on what I may call the present state of* India, and more especially of the Peninsula, sent in a few days ago, you will not have much difficulty in concluding that my time of late, has been fully occupied; for though it does not take long to write one of these reports when the pen is once fairly in hand, yet it takes no little time to prepare and arrange the materials for them. In the midst of these occupations, I have also devoted a good deal of time to botanizing; I can scarcely say to Botany, for although my collections swell rapidly in bulk, and present a considerable number of new plants, I have as yet been unable to study them. I have no doubt, speaking by guess, but I have added a hundred species to the Peninsular Flora, and I have dried three or four hundred altogether, among which are about twenty terrestrial *Orchideæ*, as *Habenaria* and its allies; but not one of which I can possibly refer to Lindley's species; perhaps however from my not having sufficiently studied the tribe to enable me rightly to understand his generic and sectional characters. We have here a new *Clematis*, perhaps two; but the second I have not seen in flower; a *Circæa*, nearly all the Neelgherry *Ranunculaceæ*, (but only a few in flower at this time,) a *Geranium, Stellaria,* and *Cerastium, Dockens, Thrashes, Potentilla*, a *Magnolia*, or something very like one (but I have not found the fruit; it has five-seeded ovaries), a *Rose*, one or two species of *Passiflora*, but only one in flower, a *Galium, Rubia, Pedicularis, Osmunda, Ophioglossum,* a fig with clustered fruit as big as apples, a new *Dodonæa*, an arboreous *Osbeckia*, not in flower; and several others. There is also an arboreous *Vaccinium?* a great tree which is abundant, but so very rare in flower, that I considered myself

very fortunate to-day when I got one far enough advanced to substantiate a former conjecture regarding its affinities, which I made from the leaves and fruit. There is a *Gordonia*, but not abundant, and a magnificent new *Berberis* of the *Mahonia* group, but with subscandent stems (it was not in flower). *Lilium longiflorum*, Wall, is very abundant, (there are probably specimens already among my plants); but it is needless to attempt remembering all that I have met with, for they are many, and as I have told you, only imperfectly studied. I set out to-morrow on a long excursion of nearly twenty miles, (which will occupy me for three days,) for the purpose of visiting some of the more productive tracts of the hills; in the course of it I expect to obtain some good plants, but not many, as it will be merely a run and back again; twenty miles of mountain travelling here being no joke, as I have but four attendants, and we have to carry every thing along with us. I found some good plants at Shevagurry, but as I was there only three or four days, and the weather was very wet, and the place swarming with jungle leeches, which rendered botanizing most disagreeable, the collections did not come up to my expectation. I was so bit by the leeches through the stockings, that my feet are scarcely yet well, and their marks are permanent.

I there discovered certainly three, and I think four species of *Santia*, and have found another here. My collections during these two excursions have exhibited so many novelties, though made under the disadvantages of haste and bad weather, as fully to confirm me in the opinion expressed in my letter to Greville from Courtallum, that we do not yet know one half of the alpine Flora of India, and to make me daily regret that my other engagements prevent me from pursuing the subject in a more satisfactory manner. The Pulney hills are very rich but exceedingly difficult to botanize over, owing to the great depth of the valleys or glens, and their extremely steep sides near the bottom, which make it almost dangerous to descend; and as each of them has a rapid stream in the hollow, it is equally difficult to ascend from the outlet. The jungle too,

which is in scattered patches, is so dense that it is nearly impossible to penetrate it. These difficulties, however, I might contrive to overcome in a great measure, if I had time and a more favourable season of the year than I have at present, which is so raw and wet as to have begun to spread fever among my attendants. There is reason enough to induce me to leave this, independent of other considerations which render a more prolonged residence impossible. My next point of ascent is the Shewarrys near Salem, but, had I time for it, I long to go over some other hills, a large detached mass about twenty or twenty-five miles distant from this. From the Shewarrys I visit the Neelgherries for a short time, and then must be guided by circumstances as to my future progress.

*October* 1. (Half-way down the hills.)—Your letter of the 21st May reached me on the 27th, that of the 2d on the 30th September, on my return from my excursion. Many thanks for your *clavis* of the *Convolvulaceæ;* I shall set about collecting them with good will, for hitherto I have paid little or no attention to them, because I never could be sure of either genus or species; now the case is altered. I have as yet seen only two to examine; the one came out readily, *Ipomæa obscura;* the other *Argyreia, cuneata,* is not an *Argyreia* but a *Rivea,* having a 4-celled ovary: the mistake has originated from the fruit examined being somewhat advanced, and not in the state of the ovary, one half of which becomes abortive at an early stage; even when considerably advanced this shows the abortive ovules, each in their more abortive cell. Notwithstanding this error of Choisy, from whose memoir principally you mention having drawn up the clavis, I intend having it copied out and published in the *Madras Journal,* as a communication from you, with drawings of some species to illustrate the mode of using it, and I shall accompany it with a request that those who find species in the peninsula not referrible to any one in it, will have the kindness to send me specimens to enable us to render that portion of our work more perfect. I shall keep a sharp look

out myself for those we have not. I have met with two if not three species of *Cuscuta*, one the other day on the hills, but not in a very good state; it seems to prefer the *Guatteria ovalifolia* as its domicile; the flowers are rather large and prettily speckled. I have at length detected flowers of the *Vaccinium?* mentioned above, and enclose you a small drawing of it; it forms a large tree with a short trunk, and many large spreading branches, leaves somewhat coriaceous and glabrous, flowers white. To-day I have procured fruit of a *Magnolia*, but the tree looks somewhat different from the one I saw on the tops of the hills, so that I cannot at present, without examination, decide if it be the same; the carpels burst down anteriorly from top to bottom, and not transversely, which I believe makes the difference between *Magnolia* and *Michelia;* that which I got to-day is a noble tree. What makes me think it not distinct from the species on the hills is, that the number of seeds, together with one or two that are abortive, (but of which I see the remains,) correspond to the number, of 3—5 ovules, in the other. Yesterday's herborizing yielded me a few specimens of what I consider a new *Parnassia;* it has capitate glands by way of nectaries, and very small flowers. But you must have patience about getting specimens of these things, for I know not when I shall see them again myself. I send all off in a few days to Palamcottah, and continue my journey; but be my return soon or late, I shall not relax my efforts to improve on the past. When I came to that part of your letter in which you speak of seeds, I could not avoid exclaiming "et tu *Brute!*" for in truth these are the pests of my life; people suppose that there is nothing more easy than for a Botanist to collect seeds: according to my experience, nothing is more difficult. There is the widest possible difference between seeds on a specimen, and seeds *per se:* the one I always look for, the other I never think of, and have made and broken so many promises on that point, that I fear to make more. I shall however do what I can both for you and De Lessert. I have at present three plant collectors, all as bad as myself at col-

lecting seeds, but shall endeavour to procure a fourth for the express purpose, so that there is hope that I shall in future be able to supply at least a part of the applications which are made to me for them.

P.S. I have just been examining the supposed *Vaccinium*, and find it a *Thibaudia* or *Gaylussacia*, or neither; unfortunately, I have not Kunth's Synopsis by me, and Sprengel is my only authority; but I suspect it to be a new genus which will embrace several other Indian species. The pendulous placentæ with pendulous ovules all round the margin are very peculiar, and the after enlargement and union of the placentæ with the axis, forming ten cells out of five is not less so; such is the case. I may one day make it the subject of a paper for our *Journal*, but I shall first write to Wallich for specimens of the other species in order to have them all well examined.

[The *Vaccinium?* belongs to Don's genus *Agapetes*, but the character given does not accord with any species I have examined: the anthers have two small recurved aristæ or horns at their back at the bottom of the tubes, which are quite free, and open each by a round pore at the apex.—Arn.*]

## XVI.—BOTANICAL INFORMATION.

[The letter from Mr Gardner printed at page 134 of this volume, was soon succeeded by the following one of so late a date as the 4th of August, of the present year, 1840; and we are sure our readers will rejoice at the invariable success which has attended the researches of this zealous Botanist.]

* Soon after this letter, Dr Wight received an appointment at Madras, where he is actively engaged superintending the publication of his *Illustrations of Indian Botany*, and his *Icones*.

Ciudade Diamantina, (formerly Tijuco),
*August 4th*, 1840.

I make use of the first opportunity that is afforded of sending letters from this place, to inform you that I arrived here safely, eight days ago. Gladly would I give you a particular account of my journey from the Villa de Arrayas, but as I am now very much occupied with drying and arranging, preparatory to sending off our late collections, it is needful to defer these details till some future time. I may however mention that we started from Arrayas on the 6th of May, and arrived at San Romao on the Rio Francisco, on the 21st of June. During the journey I collected upwards of four hundred species of plants, among which there are many fine *Compositæ*, particularly from the Serra Qual, which divides the province of Goyaz from those of Pernambuco and Minas Geraes. Between the Rio San Francisco and this place, my researches were also tolerably successful; and though I am unable to state the exact number of species, there cannot be much fewer than two hundred and fifty. You will perceive that (from this and my former statements) I have collected during last year considerably more than two thousand species. Although the country in this neighbourhood has a bare, rocky, and barren like appearance, it is very rich in new and striking plants. Owing to my arriving with all my drying papers full to the very brim with green specimens, I have as yet been able to make but two or three short excursions in the neighbourhood, during which I have found many fine plants, such as three species of purple *Vellozia*, one of them very dwarfish and growing in clusters, exactly resembling the purple variety of *Crocus vernus;* two kinds of *Physocalyx*, several *Vaccinia*, a beautiful *Arbutus* and *Rubus*, two *Lupines*, one of which forms a large shrub, many noble *Melastomaceæ*, numerous *Compositæ*, particularly those belonging to De Candolle's subdivision *Albertiniæ*, many *Lychnophoræ*, *Haplostephium*, *Lychnocephalæ*, *&c.* The genus *Lychnophora* is a most remarkable one, some of the species have the habit of

*Pines* and others of *Vellozia*. I have also found some fine species of *Barbacenia, Diplusodon, Eriocaulon, Hyptis, &c.*

I would willingly make a stay of a month in this place, where the botanical treasures would well reward my labours, but want of pecuniary funds prevents me.* Notwithstanding all my care, I find my stock reduced to thirty dollars, and here there is no means, owing to want of communication with Rio, for raising any more. My situation is thus very embarrassing. On the journey I was obliged to buy more horses, my own saddle horse having been stolen from me at San Romao. Many of those now with me are so cut up by the bad roads and worse pasture, that they have become perfect Rozinantes; and I cannot exchange them for better ones, not having money to give to boot. I had expected to find an English physician here, who would have lent me some money on a bill on Mr Harrison's house; but, a few months ago, this individual removed to Minas Geraes. I am however told that there is an English Mining Company about a day's journey from Valla de Principe, and so there I shall apply, trusting that they will not be so deficient in Christian feeling as to allow me to ask in vain, for what a countryman only can be expected to supply. Here every thing is so dear that I do not think above half a dozen dollars will be left me on my departure from this city, and how long that small sum may last I would have you to imagine. Another consideration which renders me most anxious to proceed, is the hope of receiving letters from yourself and from my friends and relations. It is now two years since the date of the last communications that have reached me, and what changes may not have taken place in that period!† I can hardly doubt

* Could our letters have reached Mr Gardner which were written two years ago, or any communications from Messrs Harrisons' house at Rio, he would have had the satisfaction of knowing that his pecuniary resources are in a very favourable state, owing to the readiness of Botanists to purchase his valuable collections.—Ed.

† Mr Gardner's forebodings were too well founded; his father having died in Glasgow, early in the present year (1840); it is now nearly twelve months since we attended his remains to the grave.—Ed.

that my first news, after this long lapse of time, will communicate the tidings that some beloved relative is no more, and this anticipation is a sad drawback to the delight which such a journey as mine affords to the Botanist. As I have not time to write to my parents by this opportunity, I shall consider it a great favour if you will inform them that I am in excellent health and spirits, and they will soon hear from myself.

It is impossible for me to form any idea of the state of my funds, as I have heard nothing of my collections, sent from Ceara and Piauhy, but I trust they reached you in good order, and if my present collection arrives safe, it will bring me much more than will cover the expenses of the journey, and thus afford me some recompence for the toils, privations, and fatigues that I have undergone during the last three years. Besides my dried plants, I have gathered many valuable seeds, including those of the finest flowering shrubs and herbaceous plants of Brazil. Among these there are no less than twenty species of *Diplusodon*, which as you know is a noble genus, two of *Physocalyx* and many kinds of *Vellozia*.

I do not expect to be able to reach Rio Janeiro before the beginning of October, nor do I believe that it will be possible to send any thing home earlier. I have collected a few charming *Orchideæ*, among them a fine species allied to *Cattleya*; it is rare to find it in flower at this season, but I have obtained a few specimens in that state. *Cacti* are very uncommon here.

I have visited some of the Diamond mines in this neighbourhood, and have seen abundance of beautiful diamonds; but alas! those which I was able to bring away are few in number! From the elevation of this place, and this being also the coldest season of the year, we are all suffering somewhat from the cold, to which we are rendered the more susceptible from coming from the hottest provinces in the country. At night we feel it most, and I regret that I can neither give to my men, nor afford myself the money to purchase, an additional supply of bed-clothes. The times however will soon, I trust,

mend with us all. This morning was particularly chilly, the thermometer down to 60° at dawn, so that I shiver when I write at such a change from what I have been accustomed to for three years, when the thermometer has continually ranged from 80° to 90° and upwards. I have been informed to-day of the death of St Hilaire, who is still well remembered by many people here. A newspaper from England would be a great treat to me, but I must still have patience.

G. GARDNER.

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[While the above letter was in print, we are gratified by the receipt of the following, which is the more welcome to Mr Gardner's friends and to his family, as coming at a time when reports were in circulation of his having come to an untimely end, (previous to its date,) owing to the fury of the populace in the disturbed district through which he was passing. The letter alludes to circumstances indeed of a private nature, yet I have been unwilling to withhold them from those readers who have felt an interest in this meritorious naturalist; for the manner in which he mentions them is alike creditable to his head and heart.]

MORRO VELHO GOLD MINES, NEAR SABARA,
PROVINCE OF MINAS GERAES, *Sept.* 2*d*, 1840.

MY DEAR SIR,—I hasten to inform you of my safe arrival here on the 29th of last month, and of my having found waiting my coming all the letters which have been sent to me from England, since the last parcel which reached me at Crato, and among these I have to acknowledge the receipt of eight from you, viz., 18th Feb., 1838, and 22d Oct. of same year; 2d Jan., 20th June, and 27th June of 1839; and also 29th Dec. of same year, 6th Feb., and 10th April of 1840. These, as you may well imagine, I cannot at present answer seriatim, this being more intended as an acknowledgment of having received them than any thing else. The melancholy accounts, of which several of them are the bearers, have affected me not a little—knowing the bad state of health under which my mother has laboured for a long series of years, I counted as almost certain upon news of her death—and although happily disappointed, the intelligence of the decease

of my father, being altogether unlooked for, has affected me the more deeply. I beg of you to accept of my best thanks for the kind attentions which you paid to the family, and to his remains, as well as for the feeling letter which I have received from you on the subject. Believe me that I feel more than I am able to express, the deep obligations which I owe to you, as well as to my excellent friend Mr Murray, for the very great interest which you have both taken in my welfare ever since I had the good fortune to become acquainted with you; and your present attentions cannot fail to render these obligations deeper than ever. Of your son William's death I had accounts a few days before I reached this place, from Roger Rigby, Esq., who I believe is a cousin of Lady Hooker. I met with him at the Cocaes Mines, and from him I had indeed a very kind reception. Poor William! cut off so early, and under such melancholy circumstances! The duke of Bedford's death has been a source of deep regret to me on many accounts. He was indeed a noble patron of science, and I feel certain, that " take him all in all, we ne'er shall look upon his like again." I am much obliged to you for your kindness in sending me the very interesting memoir which you have drawn up on him. I have read it with great interest, and from it have learned more than ever the extent of the interest, which, through you, he took in my wanderings, and the extent of his liberality towards me. It would indeed be selfish in me to wish that he had lived longer on my account: what I regret more, and what every lover of our favourite science must deeply regret, is, that he did not live to finish, or at least make a beginning, of the great national scheme which he had so deeply at heart, and with which you were to have been so intimately connected.

Since I last wrote you I have met with a severe loss. The very day on which I sent away my last letter to you, which was dated from Tijuco, three of my horses died, and shortly afterwards five more. This was no doubt occasioned by the cold rainy weather which set in for about a week after our arrival, they having been always accustomed to the great heat

of the inland provinces. The others getting into a miserable state, I was obliged to sell them for almost nothing, and since then I have been obliged to hire mules at a considerable expense to take me on. Harrison's people are the agents for this mine, and from Mrs Herring, the lady of the Chief Commissioner—he himself at present being at Rio—and from Mr Crickitt, who is acting in his place, I have received the greatest kindness and attention. Mrs H. is intimately acquainted with De Candolle, of whom she often speaks. She tells me also that the unfortunate Sellow was a frequent visitor at their house during his journeyings in Minas. I have been very particular in my inquiries both of her, and many other individuals of his acquaintance, respecting his death; and I am happy to be able to inform you, for the sake of the memory of this excellent man, that the universal impression is, that it was *accidental* and not *intentional.* Between Tijuco and this place I have made another splendid collection of plants, which I am sure will give satisfaction to my subscribers. I have in all now somewhere about 2400 species. Of late I have been very ill off for want of money, and I thought it very hard to be travelling in the famous *El Dorado* without a sixpence in my pocket. I am now however in a place where all my wants are willingly supplied. It is indeed a great satisfaction to me to have met with the great kindness which I have experienced here after a journey of about 3000 miles through the inland deserts of Brazil. I expect to be in Rio about the middle of October, and will then send you a long letter. You did right in sending my collections, for distribution, to Pamplin. The long letter which I have received from my friend Dr Joseph, I intend to answer also from Rio. With every good wish for the happiness of yourself and family, believe me ever to be, your most grateful and obliged servant,

George Gardner.

## XVII.—*On the Genus* HARPALYCE. By GEORGE BENTHAM, ESQ, F.L.S., &c., &c., &c.

AMONG the *Leguminosæ* collected by Mr Gardner in the Province of Ceara, is a very handsome red-flowered perennial, in which the structure of the flower is so peculiar, and so unlike any hitherto described Brazilian genus, that Mr Gardner, in sending it home with the No. 1548, thought himself justified in considering it as a new one, and requested that he might be allowed to dedicate it to his friend Mr Bowman.

On receiving my set, I immediately recognised this plant as one which I had examined and obtained specimens of when at Vienna in the winter of 1836–7, from the rich Brazilian collections of the late Dr Pohl. I then characterized it as new, but unable to satisfy myself as to its affinities, deferred the publication of my genus. On my return to this country I received it again from the Imperial Academy of St Petersburgh, and was about to insert a note upon it in my account of Mr Schomburgk's Guiana *Leguminosæ*, when the second parcel of Martius's "*Herbarium Floræ Braziliensis,*" reached me, containing the same plant under the No. 587; and the fear of adding another to the numerous Leguminous genera published under two names at the same time by different authors, has deterred me from noticing it, although it occurs again amongst Claussen's *Leguminosæ*, which I owe to the kindness of M. Delessert, and which I have undertaken to name; and much as I should be desirous of complying with the wishes of so zealous and intelligent a collector as Mr Gardner, I should still have thought it better to wait till I could ascertain whether it has or has not been named by Dr Martius, were I not now persuaded that it belongs to a genus already published, but which it is not likely any botanist should refer it to, unless led to it as I was in some measure by mere chance.

In studying the characters of the Leguminous "*Genera non satis nota,*" with a view to a general arrangement of the

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[illegible]

order, I was struck with the peculiarities of the *Harpalyce* of Moçino and Sessé's *Icones*, as published in the *Prodromus*, and having obtained through the kindness of Professor de Candolle, a copy of the original drawing from which his generic characters were taken, I am now convinced, that, making due allowance for evident inaccuracies in the drawing itself, the two plants belong to one genus. I have therefore no scruple in adopting the published name, and subjoining an amended character for the genus, with a description of the Brazilian species.

HARPALYCE, *Moç. et Sess. Pl. Mex. ined.—DC. Prod.* II. *p.* 523.

*Calyx* tubo brevissimo, limbo elongato bipartito, laciniis integris deciduis. *Corolla* papilionacea; *vexillum* amplum, ovato-orbiculatum, basi breviter unguiculatum, ecallosum, exappendiculatum; *alæ* vexillo breviores, oblongo-falcatæ, basi hinc auriculatæ; *carina* vexillo sublongior, linearis, obtusa, apice cum genitalibus contorta, petalis basi liberis auriculatis, superne dorso connatis. *Stamina* monadelpha, tubo superne fisso, filamento vexillari supra medium (v. interdum a basi* ?) libero. *Antheræ* lineares basifixæ, alternæ dimidio breviores. *Vagina* in disco nulla. *Ovarium* sessile lineare, pluri-ovulatum, glabrum. *Stylus* filiformis. *Stigma* parvum, capitatum. *Legumen* oblongum, compressum, coriaceum, bivalve, intus transverse multiloculare. *Semina* oblonga, strophiolata. *Embryo* rectus. *Cotyledones* carnosæ. *Radicula* brevissima.—Herbæ *perennes, erectæ, ramosæ.* Folia *impari-pinnata.* Racemi *axillares v. terminales.* Pedicelli *solitarii uniflori.*—Bracteæ *et* bracteolæ *lineares, deciduæ.*

1. H. *formosa* (*Moç. et Sess.—DC. l. c.*) foliolis obovato-oblongis basi angustatis.—In Mexico. (Char. ex Icon. TAB. V.)

* In the specimens I examined for making the drawing, the stamens appeared to be truly monadelphous, with a cleft above, yet Mr Gardner in his notes describes them as "diadelphous, one-nine."—ED.

Tab. V. Harpalyce *formosa;* from the original drawing in possession of Professor De Candolle. *Fig.* 1. Calyx and pistil ; *f.* 2. Petals ; *f.* 3. Stamens :—*slightly magnified.*

2. H. *Brasiliana*, foliolis oblongo-ellipticis basi rotundatis subcordatisve. (Tab. VI.)—In Brasilia. Sierra do Manuel Gomez, *Pohl.* in petrosis, Aldea do Chapada, *Herb. Acad. Petrop.; Martius, Herb. Bras. n.* 587 ; Caxoeiras do Campos prope Rio San Francisco Prov. Minas Geraes, *P. Claussen;* Prov. Ceara, *Gardner n.* 1548. (Piauhy. *Gardner n.* 2111. Ed.)

Herba perennis, erecta, 2—3-pedalis. Caulis ramosus, striatus, uti folia racemi et calyces dense velutino-tomentosus, tomento siccitate sæpius rufescente. Stipulas nullas vidi. Foliola opposita exstipellata, 5—10-juga cum impari, brevissime petiolulata, 1—1½-pollicaria, obtusa, penninervia. Folia floralia paucifoliolata v. suprema unifoliolata. Racemi in axillis supremis 2—6-pollicares, laxiusculi. Bracteæ ante anthesin deciduæ. Pedicelli 3—5-lin. longi. Bracteolæ sub calyce lineares, ante anthesin sæpius deciduæ. Alabastra lineari-falcata, obtusa, demum pollicaria v. parum longiora. Calycis tubus vix 1 lin. longus, late campanulatus, limbi pollicaris lacinia superior apice cucullata, inferior acuminata. Corolla rubra.* Legumen rectum, glabrum, 2—3 poll. longum, 6 lin. latum, intus dissepimentis transversalibus cartilagineis inter semina septatum. Semina fusca, funiculo 1½ lin. longo, strophiola crassa albida, testa dura lævi, cotyledonibus crassis carnosis, embryone brevissimo, radicula obtusa vix prominula.

Tab. VI. Harpalyce Brasiliana. *Fig.* 1. Vexillum ; *f.* 2. One of the alæ ; *f.* 3. Carina ; *f.* 4. Calyx and pistil *slightly magnified; f.* 5. Pod partly laid open to show the cells and seeds :—*nat. size.*

The Mexican figure (Tab. V.) represents a rather stunted

* Mr Gardner gave to his plant the specific name of *coccinea:* on the label to the Petersburgh specimen is written *Fl. purp.* It is probable that the real shade of colour may be between the two.

side branch springing almost from the root, the central stem being cut off. The foliage and inflorescence are the same as in the Brazilian species with the exception of the form of the leaflets. The flowers, very rudely represented, are also very similar, the buds are of the same form but rather thicker, the bracteolæ are generally misplaced, and to some buds as many as four are given. In a separate representation of the calyx both divisions are made to terminate in a long sharp point, though the bud is as blunt as in *H. Brasiliana*. The ovary is represented precisely as in *H. Brasiliana*, the pod is sessile, narrow and without seeds at the base, broad in the upper part, where five or six seeds are represented as forming protuberances in the pod. This pod is stated to be bilocular, though with some doubt, and it is not mentioned in which direction the cells are placed; I should suspect it to be transversely plurilocular as in *H. Brasiliana*.

The evident affinities of *Harpalyce* are with *Brongniartia*, (including *Peraltea*, now generally, and probably with reason, united to it), which has also the peculiar combination of the habit and flower of *Galegeæ*, with the fruit of a *Cassia;* and following up the principle I have elsewhere adopted, of giving more importance to the æstivation and relative position of the parts of the flower, than to the characters derived from the pod and the seed, both genera would be included amongst *Galegeæ*. Perhaps, however, when the *Brongniartiæ* are better known, as well as some other Mexican and Peruvian plants which appear to have some relation to it, it is not unlikely that a distinct subtribe may with propriety be formed to receive them.

Mr Don has established a genus *Megastegia*, which he suggests may be the same as *Harpalyce*, but his character, if accurately given, is at complete variance with it. There is nothing in *Harpalyce*, at all resembling the large bracts he mentions, unless it be the divisions of the calyx, which cannot have been mistaken for them, as Mr Don distinctly describes a calyx within them; *Megastegia* is probably therefore a third genus belonging to the same group.

## XVIII.—*Contributions towards a Flora of South America.—Enumeration of Plants collected by* Mr Schomburgk *in British Guiana.—By* George Bentham, Esq., F.L.S., &c. &c.

(*Continued from Vol. II. p.* 324.)

### Rubiaceæ.

#### Tribe, Gardenieæ.

440. Amaioua *saccifera, Mart.—DC. Prod.* iv. 370.—Swamp on the Rio Padawire, *Schomburgk.*—The flowers in the single specimen before me are all male by abortion, the ovarium being rudimentary only.

441. Genipa *Americana, Linn.—DC. Prod.* iv. 378.—British Guiana, *Schomburgk.* n. 208.—Presl's *G. barbata* appears to me to be the same plant.

442. *G. Caruto, Humb. et Kunth.—DC. Prod.* iv. 378.—Rio Branco, *Schomburgk.* n. 796.

Gardner's n. 1042 from Pernambuco is a *Genipa*, apparently new.

443. Sphinctanthus *rupestris*, gen. nov.—Rocks on the Rio Negro, *Schomburgk.* n. 900.

*Char. gen. Calycis tubus* turbinatus, *limbus* brevis, laxus, breviter 5-dentatus. *Corollæ tubus* calyce longior, superne sub fauce contractus, intus annulo pilorum barbatus; *limbus* 5-lobus, laciniis patentibus, æstivatione contorta. *Stamina* superiore tubo inserta, antheris oblongis subexsertis. *Ovarium* carnosum, biloculare, ovulis numerosis in placentis pulposis nidulantibus. *Stylus* filiformis, medio fusiformis, apice in lobos duos stigmatiferos incrassatus.

*S. rupestris.* Frutex 6-pedalis, ramulis glabris, sub axillis sæpe compressis. Folia 2-3-pollicaria, ovato-lanceolata v. oblonga, utrinque angustata, obtuse acuminata, membranacea, glabra. Stipulæ utrinque solitariæ, adpressæ, breves, latæ, acuminatæ. Flores ad apices ramulorum 1-2, sessiles. Calyx 3 lin. longus, limbo 3 lin. diametro, dentibus parvis acutis. Corollæ tubus 6 lin. longus, elongato-conicus, crassus, striatus, tomento brevissimo pubescens, laciniis obtusiusculis fere 5 lin. longis. Stigmata exserta.—Flores, teste Schomburgkio, luteæ.

This genus, of which I have not seen the fruit, is evidently

near *Posoqueria* and *Randia*, having something of the habit of the latter, but the calyx and corolla are of so peculiar a form, that I am induced to consider it as distinct. The structure of the ovary leaves no doubt as to its being rightly placed amongst *Gardenieæ.*

444. Randia *hebecarpa*, (sp. n.); spinis oppositis, foliis ovatis membranaceis junioribus pubescentibus, floribus ad apices ramulorum sessilibus solitariis pentameris, calyce tomentoso hirto, laciniis limbi lanceolatis acutis, corolla extus pilosula, tubo calycis limbo duplo longiore, limbi laciniis oblongo-ovatis vix tubo brevioribus.—*R. armatæ* affinis. Spinæ oppositæ ad apices ramulorum sub gemma florifera anni sequentis ortæ. In fructu juniore, calyces extus pilis brevibus densis canescunt. Corolla alba, tubo semipollicari.—British Guiana, *Schomburgk.* n. 775.

445. Randia *Mussændæ*, *DC. Prod.* iv. 388.—British Guiana, *Schomburgk.* n. 330.

Gardner's n. 1692 from Ceara is a *Randia.*

446. Posoqueria *longiflora*, *Aubl.—DC. Prod.* iv. 375.—British Guiana, *Schomburgk.* n. 330.

447. *P. latifolia*, *Cham. et Schlecht.—DC. l. c.*—British Guiana, *Schomburgk.*—There are two single specimens from different localities; in the one the corolla is about five inches long, in the other it is more slender and scarcely four inches long; in the latter the leaves are also smaller. In both they are thick and shining with the lateral veins scarcely prominent.

448. *P. Trinitatis*, *DC. l. c.*—British Guiana, *Schomburgk*, a single specimen.—Leaves larger than in *P. latifolia*, the veins prominent on the under side. Flowers numerous, slender, full five inches long. Stipules ten lines long.

Gardner's n. 449 from the Organ Mountains is also a *Posoqueria.* His n. 2197 from Piauhy is *Tocoyena hirsuta*, Moric., and his n. 1043 from Pernambuco, and 1337 from Alagoas are also specimens of *Tocoyena*, a genus which I do not find among Schomburgk's.

449. Coccocypselum *canescens*, *Willd.—DC. Prod.* iv. 397. —British Guiana, *Schomburgk.* n. 268.

450. *C. Tontanea Humb. et Kunth.—DC.* l. c.—French Guia-

na, *Leprieur.*—Gardner's n. 459 from the Organ Mountains is Coccocypselum *nummulariæfolium*, Ch. et. Schl.

### Tribe, Cinchoneæ.

451. Cinchona *Roraimæ*, (sp. n.); foliis amplis ovali-ellipticis basi cuneatis crassis supra glabris, subtus ramis paniculaque oblonga dense rufo-pubescentibus, calycis limbo 5-dentato, corollæ crassæ extus hispidæ laciniis limbi intus glabriusculis.—*C. macrocarpæ*, Vahl. similis, sed in hac folia basi truncata, corolla crassior tubo parum breviore adpresse pubescente nec hispido, limbi laciniæ latiores. Folia in *C. Roraimæ* fere pedalia. Panicula plusquam sex poll. longa, parum ramosa, axi sub ramificationibus compressa. Bracteæ ovato-lanceolatæ deciduæ. Calycis dentes breves, lanceolatæ, acutæ. Corolla pollicaris vel parum longior, alba, odoratissima, laciniis crassis oblongis.—A single specimen from among undershrubs in the Roraima mountains at an elevation of about 4000 feet, *Schomburgk.*

452. Remijia *tenuiflora*, (sp. n.); ramulis compressis pedunculisque leviter tomentosis v. demum glabratis, foliis ovali v. oblongo-ellipticis vix coriaceis glabris, racemis interruptis folio brevioribus v. parum longioribus, cymis inferioribus remotis pedicellatis, floribus pentameris, corollæ tubo calyce pluries longiore.—Frutex habitu *Remijiis* australibus simillimus. Folia 4-6-pollicaria, acuta v. obtusiuscula, basi cuneata. Stipulæ foliaceæ, lanceolatæ, deciduæ. Pedunculi et pedicelli compressi, apice uti flores et bracteæ tomento brevi canescentes. Flores in cymis subsessiles. Bracteæ lanceolatæ, acutæ. Calycis limbi laciniæ parum inæquales, acutissimæ, post anthesin auctæ. Corolla gracilis, alba, tubo 6-7 lin. longo, laciniis linearibus crassiusculis 4-5 lin. longis, æstivatione valvata. Antheræ medio tubo subsessiles. Stylus filiformis, lobis linearibus crassiuscule stigmatiferis, capsula oblonga, 7 lin. longa, septicide dehiscens, valvulis integris. Placentæ lineares, crassæ. Semina pauca, placentæ appressa v. subimmersa, peltata, utrinque in alam oblongam membranaceam producta.—Barcellos on the Rio Negro, *Schomburgk, n.* 952.

453. R. *densiflora* (sp. n.); ramulis compressis pedunculisque adpresse pubescentibus, foliis ovali-ellipticis coriaceis glabris supra nitidis, pedunculis folio longioribus apice corymbosis, floribus tetrameris, corollæ tubo calyce vix longiore. —Frutex 12—15-pedalis. Folia 4—5-pollicaria, acuminata, basi in petiolum brevem angustata. Stipulæ membranaceo-foliaceæ, lato-lanceolatæ, obtusæ, deciduæ. Pedunculi infra corymbum 7—8-poll. longi. Folia sub corymbo duo ovata, acuta, corymbo breviora. Bracteæ lineares, floribus breviores. Corymbus densus. Flores sessiles. Calycis laciniæ post anthesin auctæ, valde inæquales. Corolla extus villosa, tubo vix 3 lin., laciniis 1½ lin. longis. Genitalia et fructus ut in præcedente, nisi capsula parum longior tenuior.—Mount Parima. *Schomburgk.*

Both De Candolle and Endlicher, in drawing up the character of *Remijia*, from Aug. de St Hilaire's description, state the valves of the capsule to be bifid, but this is a mistake. St Hilaire's words are, "s' ouvrant en deux valves par le milieu de la cloison, dont chaque moitié présente alors dans son milieu une interruption linéaire," an obscure expression, in which however the relative *dont* refers to the *cloison* not to the *valves.* It is true he adds "(dehiscence loculicide)," but this is evidently a slip of the pen, as it neither accords with what immediately precedes, nor yet with the positive statement (p. 5) that the three plants in question agree with *Cinchona* in their septicidal dehiscence, and that *Macrocnemum* differs from them by the loculicidal dehiscence. In both the new species described above, the valves are perfectly entire.

*Exostemma australe, A. de St Hil., E. formosum, Cham. et Schlecht.*, and probably also *E. cuspidatum, A.de St Hil.* which last I have not seen, are certainly not truly congeners to the West Indian *Exostemmata,* for besides the marked difference in the form of the flower and anthers, and in the habit, the ovules of the South Brazilian species are horizontal without any perceptible membranous expansion, whilst those of the true West Indian *Exostemmata* are ascending, imbricate, flat and membranous at the time of flowering.

454. Calycophyllum *coccineum, DC. Prod.* iv. 367.—San Gabriel on the Rio Negro, *Schomburgk, n.* 1011.—The specimens are perfectly similar to those I have from Trinidad.

455. Buena *triflora;* foliis ovali-ellipticis obtusis, floribus ternis pedicellatis, corollæ limbi laciniis oblongis obtusis.—Arbor 20—30-pedalis. Ramuli crassi, subcarnosi. Folia 3—5-pollicaria, petiolata, crassa, nitida. Stipulæ ovatæ obtusæ v. emarginatæ, membranaceæ, deciduæ, vel florales sub pedicello persistentes. Pedicelli fere pollicares. Calycis tubus turbinatus, limbus deciduus, breviter 5-fidus. Corollæ tubus 3—3½ poll. longus, crassiusculus, glaber ; limbi laciniæ ultrapollicares, intus minute subpuberulæ, æstivatione contorto-imbricativa. Antheræ superiori tubo insertæ, lineares, obtusæ, basi sagittatæ, e fauce dilatata breviter exsertæ. Stylus breviter exsertus, stigmate crasso bilamellato. Ovarium biloculare, placentæ in quoque loculo magnæ bialatæ, ovulis numerosis adscendentibus imbricatis, appendice membranacea apice lacera terminalis.—Falls of the Rio Quitaro, *Schomburgk. n.* 553.

The above species is truly congener to the Peruvian *B. acuminata,* and *B. obtusifolia,* and form a very natural genus very nearly allied, it is true, to *Hillia,* but perfectly distinct from *Cinchona* by the form of the flower, and more especially by the æstivation of the corolla. The *Buena hexandra* of Pohl, and *Cosmibuena ochracea* of Endlicher, on the contrary, are as unlike them in habit as in character ; they have the valvate æstivation, and as far as I can see, all the essentials of true *Cinchonæ,* with nearly the habit of *C. macrocarpa, C. Roraimæ, &c.*

Gardner's n. 450, from the Organ Mountains is *Coutarea speciosa,* Aubl., his 2195 from Piauhy is a new species of *Coutarea,* so also *n.* 2196 from the same province, notwithstanding its pentamerous flowers. No. 455 and 456, from the Organ Mountains, and 1699 from Ceara, belong to *Manettia.* Blanchet's n. 2838, from Serra Acurua, is *Coutarea mollis,* Cham.

Tribe, RONDELETIEÆ.

456. Aspidanthera *Rudgeoides*, gen. nov.—Islands on the Rio Negro, *Schomburgk*, *n.* 969.

CHAR. GEN. *Calyx* obovoideus, limbo brevissimo 4-dentato. *Corollæ tubus* longus gracilis, faux dilatata nuda, limbi laciniæ 4, latæ, obtusæ, patentes, æstivatione contorto-imbricativa. *Stamina* 4, medio tubo inserta, exserta. *Antheræ* lato-ovatæ, recurvo-convexæ. *Ovarium* subcarnosum, biloculare, ovulis in quoque loculo plurimis biseriatis, deorsum imbricatis. *Stylus* filiformis, stigmatibus 2 brevibus divergentibus. Fructus . . . .

*A. Rudgeoides.* Frutex glaber. Folia ovata v. ovato-lanceolata, 4—6-poll. longa, acuminata, basi late cuneata, membranaceo-chartacea, suprema, sub inflorescentia, sæpe parva colorata. Stipulæ subfoliaceæ, lanceolatæ, 7—8-lin. longæ, deciduæ. Panicula thyrsoidea, densa, terminalis, ramis brevibus trichotomis, floribus subsessilibus. Flores albi, juniores tomento pulverulento cito deciduo vestiti. Corollæ tubus 8—9-lin. longus, limbi laciniæ crassiusculæ, margine undulato-crispæ. Ovulæ in quoque loculo ovarii circa decem.

The appearance of the specimens is precisely that of the figure of *Rudgea lanceæfolia*, Salisb., *Linn. Trans. v.* ix. *t.* 18; but the characters of the flower are totally different from that given by Salisbury. The genus is probably allied on the one hand to *Catesbæa*, on the other to *Rondeletia*.

457. Rondeletia *capitata* (n. sp.); foliis ovatis obtusiusculis basi rotundatis utrinque ramisque hirsutis, stipulis longe subulato-acuminatis, pedunculis axillaribus folio brevioribus apice cymoso-capitatis, bracteis lineari-subulatis hirtis, floribus tetrameris, calycis hispidi laciniis linearibus, 2 majoribus corollæ hirtæ tubo dimidio brevioribus.—Specimen unicum tantum suppetit. Folia pollicaria, brevissime petiolata, venis lateralibus utrinque circa 5 subtus valde prominentibus. Stipulæ utrinque solitariæ, hirtæ, petiolo longiores. Corollæ tubus tenuis 2 lin. longus, limbi laciniæ 1½ lin. Stamina inclusa. Stylus subexsertus, lobis stigmatiferis 2 subulatis.

Ovarium carnosulum biloculare, ovulis in quoque loculo pluribus, placentæ crassiusculæ affixis.—Mount Roraima, *Schomburgk.*

458. Sipanea *pratensis, Aubl.—DC. Prod.* iv. 414.—French Guiana. *Leprieur, Herb. Par. n.* 173.

459. S. *dichotoma, Humb. et Kunth.—DC. l. c.*—Moist savannahs, British Guiana. *Schomburgk, n.* 15 and 95.

Tribe, HEDYOTIDEÆ.

460. Oldenlandia *herbacea, DC. Prod.* iv. 425.—British Guiana. *Schomburgk, n.* 17.—Pernambuco, *Gardner n.* 928.—This plant varies much in the length of the peduncle, which is longer or shorter than the leaves, and though generally one-flowered, occasionally bears two or three flowers.

Tribe, HAMELIEÆ.

461. Evosmia ? *corymbosa* (sp. n.); foliis petiolatis ovatis acuminatis supra glabris subtus junioribus ramulisque puberulis demum glabratis, pedunculis terminalibus corymbosis pubescentibus.—Frutex elatus v. arbor parva. Folia bipollicaria, longiuscule petiolata, subtus secus venas sæpe barbulata, demum subcoriacea. Stipulæ anguste lanceolatæ, acuminatæ, utrinque solitariæ, citissime deciduæ. Corymbi trichotomi, ramulis compressis. Flores in ultimis ramis sessiles. Bracteolæ calyce breviores, membranaceæ, deciduæ. Calycis tubus ovatus, limbus persistens 4—5-lobus, laciniis ovali-oblongis membranaceis obtusis tubo æquilongis, sinu obtuso separatis. Corolla breviter infundibuliformis, tubo 1 lin. longo, limbo patente 4—5-partito, laciniis oblongis fere 2 lin. longis, basi intus dense barbatis. Stamina tubo inserta, exserta. Antheræ ovatæ. Ovarium 4—5-loculare, loculis pluri-ovulatis. Stylus filiformis, apice in lacinias 4—5-lineares stigmatiferas divisus. Fructus (in specimine nondum maturus) fere globosus, vix carnosus, 4—5-locularis, loculis pleiospermis, seminibus angulatis, pulpo nullo.—British Guiana (on the Berbice?) *Schomburgk, n.* 325, on the Quitaro, n. 558, and on the Rio Branco, n. 794. Mr

Schomburgk states the wood to be deleterious, and that Indians have been poisoned by using it to make spits for roasting.—The inflorescence and some points in the character of the plant do not quite coincide with *Evosmia*, Humb. and Kunth, but the differences are scarcely sufficient to characterize a genus.

462. Brignolia *pubigera* (sp. n.); foliis subtus ramulis inflorescentiaque breviter pubescentibus, panicula ovata.—In omnibus fere cum descriptione *B. acuminatæ* convenit. Stipulæ eædem. Folia in specimine unico 6—7-pollicaria, supra glabra lævia, subtus pube brevi præsertim in venis donata. Paniculæ rami oppositi v. verticillati, dichotomi. Flores in dichotomiis sessiles, rosei. Calyx turbinatus, limbo inæqualiter sinuato-dentato. Corollæ semipollicaris laciniæ limbi ovali-oblongæ, patentes, tubo breviores. Stylus filiformis, apice globosus emarginatus, emarginatura stigmatifera. Ovarium 4-loculare. Cætera *B. acuminatæ*.—British Guiana, *Schomburgk*.—A single specimen.

463. Sabicea *cinerea*, *Aubl.*—*DC. Prod.* iv. 439.—French Guiana, *Leprieur*, *Herb. Par. n.* 101. and 102.—Gardner's n. 1697 from Ceara, appears to be a mere variety of this species with somewhat narrower leaves.

464. S. *glabrescens* (sp. n.); foliis oblongo- v. ovali-ellipticis acuminatis junioribus ramulisque hirtellis adultis glabratis, stipulis late cordato-ovatis obtusis membranaceis, floribus pentameris fasciculatis sessilibus, calycis laciniis linearibus tubo corollæ ter quaterve brevioribus.—Affinis *S. hirtæ*, Swartz. Folia basi minus angustata et demum fere omnino glabra. Calycis laciniæ 1 lin. longæ, glabræ. Corolla hirta tubo fere 4 lin., limbi laciniis 1 lin. longis.—Abandoned Indian settlements on the Rio Quitaro, *Schomburgk*, *n.* 538.

465. S. *velutina* (sp. n.); foliis ovatis acutis basi rotundatis crassis supra velutino-hirtis subtus tomento subfloccoso denso albidis, stipulis ovatis acutis, floribus pentameris fasciculatis sessilibus, calycis lanati laciniis lanceolatis tubo corollæ dimidio brevioribus.—Calycis laciniæ 2 lin. longæ, acutæ. Co-

rolla rosea, hirta, tubo 4 lin. longo, laciniis limbi brevibus.—A single specimen from Mount Canaupang, *Schomburgk.*

Gardner's n. 1687 from Ceara, and 2198 from Piauhy, are two new species of *Alibertia*. Of 1151 from Pernambuco, I have male flowers only, but it appears to be the same species as 1687.

466. Patima? *laxiflora* (sp. n.); foliis ovali-ellipticis utrinque glabris, pedunculis elongatis 5—9-floris.—Frutex divaricato-ramosus, glaberrimus, resinosus. Folia petiolata 2—4-pollicaria, obtusa, basi acuta. Stipulæ breves, vaginantes. Pedunculi terminales v. demum axillares, 2-pollicares. Pedicelli oppositi distantes subsemipollicares. Flores pentameri, abortu dioici: Masc. Calyx tubulosus, truncatus, obscure 5-dentatus. Corollæ tubus breviter exsertus, intus annulo pilorum barbatus, limbus 5-fidus, laciniis æstivatione contorto-imbricativa. Stam. . . . Stylus filiformis superne incrassatus, acutus, ex ovarii rudimento carnoso ortus. Fœm. Bacca globosa, costata, calyce coronata, 5-locularis (in 5 coccos secedens?) placentis 5 duris bifidis. Semina numerosissima, minutissima, pulpa tenui involuta.—Of this I have seen two branches only, the one with a few male flowers half destroyed by worms, the other bearing two or three berries not yet ripe. On account of the remarkable structure of these fruits, I have placed the species under *Patima;* but perhaps the flowers when better known, may show it to be a new allied genus.

### Tribe, Isertieæ.

467. Isertia *coccinea, Vahl.—DC. Prod.* iv. *p.* 437.—French Guiana, *Herb. Par. n.* 98.

468. I. *hypoleuca* (sp. n.); foliis ovalibus acuminatis basi acutis subtus albo-tomentosis, thyrso paniculato brevi multifloro, bracteis ovatis, calycis limbo truncato subintegerrimo.—Affinis *I. coccineæ*, sed præter notas supra datas, differt etiam petiolis longioribus, et corollis plus quam 2 poll. longis. In speciminibus suppetentibus corollæ nonnullæ, ab insecto quo-

dam punctæ, breves evadunt infundibuliformi-campanulatæ. —British Guiana, *Schomburgk*, *n.* 281.

Tribe, Cordiereæ.

469. Cordiera? *acuminata* (sp. n.); foliis oblongo-lanceolatis acuminatis utrinque acutis subcoriaceis glabris, corollæ laciniis acuminatis acutis.—Frutex glaber, divaricato-ramosus, ramulis compressis. Stipulæ utrinque integræ, ovato-lanceolatæ, acutissimæ, ramulo adpressæ, parum conspicuæ. Folia 3—4-poll. longa, supra nitidula, glaberrima. Flores in specimine suppetente abortu masculi, ad apices ramulorum terni, sessiles. Calycis limbus cupuliformis, margine pellucido truncato integro, tubo cum ovarii rudimento connato. Corolla hypocrateriformis, tubo 5 lin. longo, in sicco extus canescens, consistentia firma crassiuscula, laciniis 4 lanceolatis acuminatis, æstivatione contorto-imbricativa. Faux intus pubescens. Stamina infra faucem corollæ inserta. Antheræ subsessiles, inclusæ, oblongo-lineares. Ovarii rudimentum carnosum, disco carnoso libero coronatum. Stylus erectus, inclusus, apice acutus. Flores fœminei . . . . . . Bacca depresso-globosa? plurilocularis? Semina circa 10, irregulariter late ovoidea, compressa, hinc plana, testa membranacea, albumine subcorneo albido. Embryo brevis rectus, teres, cotyledonibus conferruminatis, radicula juxta hilum.—British Guiana, *Schomburgk;* a single specimen with male flowers only, and a loose berry too much broken to admit of ascertaining the number of cells, but on account of the few large seeds combined with the general appearance of the plant, it appears probably to be a *Cordiera.*

470. C.? *latifolia ;* foliis ovali-ellipticis obtusis v. breviter acuminatis basi cuneatis submembranaceis glabris, calycis margine obliquo, corollæ laciniis acutiusculis.—Ramuli compressi. Folia 5—6-pollicaria. Flores in specimine unico omnes masculi, iis *C. acuminatæ* similes, nisi calyce paullo majore, margine obliquo, corollæ tubo crassiore, laciniis paullo brevioribus.—British Guiana, *Schomburgk.*

Of Gardner's n. 1689 from Ceara, and 2460 from Piauhy,

I have also male flowers only. The former appears to be allied to the preceding, the flowers are some tetramerous, some pentamerous. His n. 2460 is rather perhaps an *Alibertia.*

It appears to me not improbable that *Gardeniola*, Cham., and possibly *Octavia, DC.*, will, when better known, prove to be referrible to *Cordiera,* and that this genus will be found to have a four or five-celled ovary, with two ovules in each cell, of which either all or a portion only ripen into seeds. *Thieleodoxa,* Cham., would then differ only in the cells of the ovary being reduced to three. *Scepseothamnus gardenioloides,* Cham., described as having two cells with one ovule in each cell attached to the dissepiment by its flat face (which is unusual in the order), must remain doubtful. The two other species of *Scepseothamnus*, of which the male flowers only are known, may belong to any of the above genera or to *Alibertia.*

471. Retiniphyllum *scabrum,* (sp. n.); foliis obovato-oblongis vix brevissime acuminatis basi angustatis coriaceis, supra demum nitidis, subtus scabro-pubescentibus, pedunculis terminalibus brevibus bifloris.—Frutex ramulis pilis rigidis hirtus. Folia ramulorum sterilium 3-4-pollicaria, supra sæpe præsertim versus marginem pilis minutis sparsis scabrida, cæterum nitida, subtus pilis rigidis brevibus appressis scabra; stipulæ vaginantes, petiolo subæquilongæ, acuminatæ, utrinque apice bifidæ, dense hirtæ. In ramulo florifero stipulæ (an delapsæ?) ad vaginam brevem truncatam reductæ; folia breviora quam in ramo sterili, omnia supra lævia nitida. Pedunculi gemini, rigidi, 2-3-lin. longi. Flores in quoque pedunculo gemini, subsessiles. Bracteolæ breves cupulatæ, dentatæ. Calyx oblongus, 4-5-lin. longus, basi attenuatus, limbo tubuloso breviter 5-dentato. Corolla coccinea, extus pubescens; limbi laciniæ oblongæ, 5-lin. longæ; tubus pollicaris, intus supra annulum pilorum pubescens, infra glaber. Stamina fauci inserta, exserta. Filamenta laciniis corollæ parum breviora. Antheræ ovatæ, connectivo in acumen producto. Ovarium disco coronatum 5-loculare, loculis 2-ovulatis. Stylus pubescens, stigmate incrassato indiviso.—Axillæ foliorum, pedun-

culi et calyces resinosi.—Gathered by *M. Schomburgk* in his excursion to Roraima and Esmeralda, but without the precise locality being indicated.

472. Commianthus *Schomburgkii.* (gen. nov.) Savannahs of British Guiana, *Schomburgk. n.* 179.

CHAR. GEN. *Calycis limbus* tubulosus truncatus, dentibus 5 brevibus setaceis persistens. *Corollæ* tubus brevis, limbus 5-partitus, patens, laciniis æstivatione contorto-imbricatis. *Stamina* fauci inserta, exserta. *Filamenta* crassiuscula. *Antheræ* lineares. *Ovarium* carnosum, disco coronatum, 5-loculare, ovulis in quoque loculo 2 collateralibus. *Stylus* filiformis, superne incrassatus, apice brevissime 5-lobus, lobis stigmatiferis. *Bacca* globosa, calyce coronata, 5-locularis, loculis abortu monospermis.

*C. Schomburgkii.* Frutex 10-15-pedalis. Ramuli pube brevi exasperati. Stipulæ utrinque solitariæ, late triangulares, breves. Spicæ terminales simplices viscoso-pubescentes uti flores gummam resinosam exsudantes. Flores fere oppositi sessiles, delapsi cicatricem oblongam in rhachide relinquunt. Calyx 2½ lin. longus. Corollæ tubus calycem vix excedens, glaber; limbus utrinque pilis adpressis pubescens, laciniis oblongo-linearibus 3½ lin. longis.

## Tribe, GUETTARDEÆ.

473. Guettarda *macrantha*, (sp. n.); foliis late ovatis breviter acuminatis basi obtusis, supra sparse pubescentibus, subtus sericeo-villosis, stipulis ovatis acutis undulatis, pedunculis folio brevioribus, floribus dense cymosis, bracteis lineari-lanceolatis calyce truncato integro parum brevioribus, corollæ sericeæ tubo longissimo, limbi laciniis 5-6-planis v. vix undulatis.—Folia ampla fere *G. crispifloræ.* Inflorescentia *G. scabræ.* Corollæ demum plus quam 2½ poll. longæ, albæ, odore Rosæ.—Dry savannahs, British Guiana, *Schomburgk.* n. 778.

Gardner's n. 1152 from Pernambuco, and 1696 from Ceara belong to *Guettarda.*

### Tribe, Cephaelidæ.

474. Cephaelis *tomentosa*, Willd.—*DC. Prod.* iv. 533.—woods of the Essequibo, *Schomburgk*, *n.* 30.

475. C. *rosea*, (sp. n.); fruticosa, glabra, ramis teretibus, foliis elliptico-oblongis subovatisve utrinque longe acuminatis, stipulis utrinque binis subulatis basi breviter junctis, capitulis pedunculatis terminalibus glabris, bracteis numerosis late cordato-ovatis acuminatis flores longe superantibus.—Affinis *C. bracteocardiæ*, sed capitulis glabris majoribus, bracteis majoribus numerosis et foliis latioribus abunde distincta.—Banks of the Essequibo, *Schomburgk. n.* 156.

476. C. *bracteocardia*, *DC. Prod.* iv. 533. French Guiana. *Leprieur*, *Herb. Par. n.* 156.

477. C. *violacea*, *Willd.—DC. l. c.*—French Guiana, *Leprieur*.

Gardner's n. 1041 from Pernambuco, and 1317 belong to *Evea* of Aublet, as characterized by Chamisso, (Linnæa ix. 237), the ovary and fruit, however, of Aublet's original species are as yet unknown. One species (n. 1041,) is the same as *Salzmannia nitida, DC.*, the other, (n. 1317,) appears to be Chamisso's *Evea Brasiliensis*. The ovary in both is bilocular, with one pendulous ovule in each cell; the fruit as described by Chamisso.

Gardner's n. 451 and 452 from the Organ Mountains, are species of *Suteria*, the former is very near to the *S. calycina*, which I have also from the neighbourhood of Rio Janeiro.

### Tribe, Psychotrieæ.

478. Palicourea *crocea, DC. Prod.* iv. 526?—British Guiana, *Schomburgk*.—A single specimen; stipules as in *P. riparia*.

479. P. *riparia*, (sp. n.); ramulis glabris, foliis breviter petiolatis ovali-lanceolatis acuminatis basi rotundatis v. vix angustatis margine undulatis supra glabris subtus secus venas hirtellis v. demum glabris, stipulis vagina brevissima parvis dentiformibus, panicula longe pedunculata subcorymbosa.—Frutex. Folia 4-6 poll. longa. Pedunculus folium

superans, superne angulatus compressus. Corolla lutea, tubo intus annulo pilorum barbato, basi gibbo, laciniis limbi brevibus reflexis. Bacca (teste Schomburgkio) nigra.—Affinis *P. croceæ*.—Banks of rivers, British Guiana, *Schomburgk, n.* 337.—In these specimens the anthers are included within the tube, and the style is exserted, but in *Palicourea*, as well as in *Psychotria*, the proportionate length of the stamens and style is variable in the same species, depending apparently on sexual distinctions.

480. P. *Guianensis, Aubl.—DC. Prod.* iv. 509.—Sandy soil, British Guiana, *Schomburgk, n.* 497.—I have two specimens: in the one, with exserted stamens, the leaves are near a foot long, of the form figured by Aublet, and nearly smooth; in the other, with exserted style, the leaves are broader and rough on the surface.

481. P. *rigida, Humb. et Kunth.—DC. l. c.*—Savannahs, British Guiana. *Schomburgk, n.* 264.

Gardner's n. 447, and 448, from the Organ Mountains, and 1040 from Pernambuco belong to *Palicourea.*

482. Psychotria *Mapouria, Rœm. et Schult.—DC. Prod.* iv. 509.—British Guiana, *Schomburgk*—a single specimen.—The characters by which the group of *Mapouriæ* are maintained by Endlicher as distinct from *Psychotria*, appear scarcely sufficient to constitute more than a section.

483. P. (Mapouria) *remota* (sp. n.); glabra, foliis ovalibus ovato-oblongis v. ovato-lanceolatis acuminatis basi rotundatis cuneatisve nitidis, stipulis lato-ovatis acutis deciduis petiolum æquantibus, pedunculis terminalibus demum lateralibus elongatis, ramis oppositis verticillatisve inferioribus remotis apice cymiferis trichotomis, calycibus brevissime dentatis, corollæ glabræ ad faucem barbatæ laciniis limbi tubo subcampanulato æquilongis.—Forte *P. sororiæ*, DC., nimis affinis. Duæ adsunt varietates, in altera folia coriacea, nitida, 4—6-poll. longa, 2—2½-poll. lata; in altera folia minus coriacea, latiora, basi potius cuneata quam rotundata.—On the Rio Negro, *Schomburgk, n.* 963.

484. P. (Veræ) *chlorantha* (sp. n.); glaberrima, ramis

compressis, foliis oblongis acuminatis basi longe angustatis coriaceis lucidis, stipulis deciduis in duas axillares fuscas late ovatas obtusissimas connatis, pedunculis trichotomis ramis apice dense cymiferis, calyce truncato minute ciliato, corolla profunde fissa intus dense barbata.—Arbor 30-pedalis, ligno albo, molli. Folia 4—6-poll. longa, in petiolum longe angustata. Pedunculus terminalis, petiolo æquilongus; rami primarii elongati, ultimi brevissimi, omnes compressi. Corolla viridis (teste Schomb.), vix $1\frac{1}{2}$-lin. longa. Iconi Kuntheanæ *P. lucidæ* similis, sed in hac stipulæ acutæ dicuntur et corolla alba.—Sandy hills, British Guiana, where it is called "Surrysurrero," by the Indians, *Schomburgk, n.* 488.

To this group, distinguished chiefly by the brown membranous deciduous stipules and paniculate inflorescence, without any, or with very small bracts, belong the *P. Carthaginensis, alba, elliptica*, &c.

485. *P. fimbriata* (sp. n.); glabra, dichotoma, foliis subsessilibus ovatis acuminatis basi rotundatis cuneatisve membranaceis, stipulis ovatis apice cartilagineo-fimbriatis, pedunculis terminalibus trifidis dichotome cymosis folio brevioribus laxis, calycis limbo campanulato truncato, corollæ fauce pubescente.—Frutex 12—16-pedalis. Folia 2—4-pollicaria. Rami paniculæ virides, breves, subcompressi. Bracteæ minutæ. Flores in dichotomiis sessiles. Calyx pentagonus, limbo laxo viridi tubo suo æquilongo. Corolla alba, tubo fere 1 lin. longo, limbi laciniis tubo æquilongis. Antheræ et stylus breviter exsertæ.—Banks of the Essequibo, *Schomburgk, n.* 51.—This species has the stipules of some *Coffeæ*, but the flowers are certainly those of *Psychotria*. The fruit in this case, as in that of most of the *Rubiaceæ* of the collection, is unfortunately wanting.

486. P. (Paniculatæ) *cordifolia, Humb. et Kunth, Nov. Gen.* iii. *p.* 365.—Siderodendron paniculatum, *Willd.—DC. Prod.* iv. 478.—Paniculæ, uti in *Psychotriis* nonnunquam observatur, utprimum terminales sunt, demum ramulo axillari elongato laterales evadunt. Flores, etsi tetrameri, omnino *Psychotriæ*.—A single specimen from the Conocon Mountains, *Schomburgk.*

487. P. (Paniculatæ) *subundulata,* (sp. n.); glabra, ramis compressis, foliis ovatis oblongisve acuminatis basi rotundatis v. supremis angustatis, stipulis utrinque brevissime bidentatis, panicula pedunculata foliis breviore, ramis oppositis dichotomis flexuosis ebracteatis, floribus sessilibus parvis, calycis limbo minute 5-dentato; corollæ imberbis laciniis limbi tubo brevioribus.—Rami valde compressi. Folia 4—8-pollicaria, margine sæpius undulata. Flores $1\frac{1}{2}$ lin. longi. —On the Rio Negro, *Schomburgk, n.* 972.

488. P. (Paniculatæ) *longistipula* (sp. n.); ramulis vix compressis junioribus puberulis, foliis ovali-ellipticis acuminatis basi longiuscule angustatis supra glabris subtus ad venas puberulis demum glabratis, stipulis utrinque binis longis linearibus vagina fimbriata, panicula brevi puberula ramis sparsis dichotomis ebracteatis, floribus sessilibus parvis, calycis limbo minute 5-dentato, corollæ imberbis laciniis limbi tubo subbrevioribus.—Folia semipedalia. Stipulæ 6-8 lin. longæ. Flores vix sesquilineares.—Rio Negro, *Schomburgk, n.* 948.

489. P. (Paniculatæ) *cornigera* (sp. n.); glabra, ramulis compressis, foliis ovali-ellipticis longe acuminatis basi angustatis cuneatis, stipulis utrinque binis e basi latiuscula subulato-acuminatis, panicula corymbosa ramis subumbellatis ad axillas sæpe barbatis dichotomis ebracteatis, floribus sessilibus, calycis tubo minute 5-dentato, corollæ ad faucem barbatæ laciniis limbi tubum subæquantibus apice patentibus dorso cornutis.—Folia 4—6-pollicaria, supra nitidula, pergamacea, margine sæpius undulata subsinuata. Flores numerosi, 2 lin. longi.—Habitu ad *P. Bahiensem*, DC., accedit, et flores ejusdem magnitudine, differt tamen foliorum et stipularum forma, corollis cornutis.—British Guiana, *Schomburgk, n.* 251.

490. P. (Paniculatæ) *crassa* (sp. n.); glabra, ramulis teretibus crassis, foliis obovato-oblongis acuminatis basi angustatis crassiusculis rigidis, stipularum vagina laxa membranacea persistente integra, cyma terminali corymbosa folia superante, bracteis parvis lanceolato-subulatis, floribus tetrameris, calyce acute dentato, corollæ ad faucem barbatæ limbo tubum subæquante, laciniis apice dentatis dorso cornigeris.

—Frutex erectus. Ramuli, folia et inflorescentia fere *P. parasiticæ*. Folia 2—3-pollicaria. Corymbus regulariter trichotomus. Flores roseo-albi. Corollæ 3 lin. longæ, tubo tenui, fauce abrupte ampliata.—Marawaca, *Schomburgk*; a single specimen.—The two latter species differ from others of the group by the appendages on the back of the divisions of the corolla near the apex, but in those genera of *Rubiaceæ* which, like *Psychotria*, have a valvate æstivation, and a tendency to a general thickening of the divisions of the corolla, these appendages do not appear to be of much importance, and the tetramerous flowers occur occasionally in most of the groups into which this extensive genus may be distributed. I doubt much, however, whether any characters can be found to raise any of these groups into distinct genera, at least as to the American species.

Among the group which I have called *Paniculatæ*, (distinguished by the loosely paniculate or corymbose flowers, minute bracts and persistent stipules consisting of a membranous sheath, often very short, with two teeth or rigid green stipules on each side,) I would include Gardner's n. 1339 from Alagoas, and probably his 454 from the Organ Mountains; besides *P. Bahiensis*, *DC.*, and many other published Brasilian species. Amongst the latter is the *P. leiocarpa*, Cham., which is Gardner's n. 453 from the Organ Mountains, and which I have received from Martius under n. 112 of his Herbarium Brasiliense. The n. 232 of the same herbarium, also referred by Martius to *P. leiocarpa*, is, in my set at least, a species of *Faramea*.

491. P. (Bracteatæ) *setifera* (sp. n.); glabra, foliis oblongo-lanceolatis setaceo-acuminatis basi angustatis, stipulis utrinque binis subulatis petiolum brevem æquantibus, panicula folia superante trichotoma, bracteis anguste linearibus setaceo-acuminatis flore parum brevioribus, corollæ glabræ imberbis laciniis limbi tubo parum brevioribus.—Folia 2-2½-pollicaria. Flores numerosi, 3 lin. longi.—A single specimen which was in my set amongst those of *Sipanea dichotoma*, the No. being probably lost.

492. P. (Bracteatæ) *inundata* (sp. n.); glabra, foliis ovali-oblongis v. ellipticis longe acuminatis basi cuneatis, stipulis utrinque binis subulato-acuminatis acutis petiolo longioribus basi dilatatis breviter v. ultra medium connatis subdeciduis, panicula pedunculata ovata laxa multiflora, bracteis lineari-oblongis membranaceis corolla glabra parum brevioribus.—Frutex. Folia 3-4-pollicaria, subcoriacea, venis utrinque prominentibus parallelis arcuatis. Pedunculus folio subbrevior, irregulariter ramosus, ramis apice cymiferis. Flores sessiles. Bracteæ 2-3-lin. longæ. Corollæ tubus 3-lin, longus, faux ampliata, limbi laciniæ latiusculæ, tubo dimidio fere breviores. —On the banks of the river Essequibo, where they are liable to inundation.—*Schomburgk. n.* 27.

493. P. (Bracteatæ) *arcuata* (sp. n.); glabra, foliis ovalibus v. ovali-oblongis acuminatis basi rotundato-cuneatis, stipulis utrinque binis linearibus acutis petiolo longioribus persistentibus, panicula pedunculata ovata laxa multiflora, bracteis lineari-oblongis membranaceis corollæ glabræ tubo parum brevioribus.—Very near to the last species of which I at first considered it a mere variety, but the leaves are shorter and more veined, the stipules, which are half-an-inch long as in *P. inundata*, are, however, free immediately above the short sheath, and do not appear to fall off, and the flowers are larger, the tube of the corolla being about 3 lines long.—On the Berbice, *Schomburgk*, *n.* 415.

494. P. (Bracteatæ) *bracteata*, *DC. Prod.* iv. 510? On the Rio Negro, *Schomburgk*, *n.* 861.

495. P. (Bracteatæ) *nervosa* (sp. n.); glabra, ramulis compressis, foliis subsessilibus ovali-oblongis acuminatis basi cuneatis submembranaceis supra nitidis, stipulis utrinque brevissime bidentatis, cyma pedunculata trichotoma densa, bracteis foliaceis oblongis mucronatis nervosis margine nudis corollas glabras subæquantibus.—*P. lupulinæ* affinis sed foliis angustioribus stipulis bracteisque distincta videtur. Corollæ albæ, majores, laciniis limbi acutissimis tubo æquilongis.—Low marshes of the Essequibo, *Schomburgk*, *n.* 26, in the earlier sets.—The *Cephaelis justiciæfolia* of Rudge appears to

me from his figure to be rather a *Psychotria* very near to this species.

496. P. (Bracteatæ) *lupulina* (sp. n.); glabra, ramulis compressis, foliis breve petiolatis ovatis acuminatis basi rotundato-cuneatis membranaceis, stipulis e vagina brevissima utrinque binis linearibus, cyma pedunculata trichotoma densa, bracteis ovatis membranaceis obtusis mucronatis margine ciliatis corollas glabras æquantibus.—Folia 5-6-pollicaria. Stipulæ $1\frac{1}{2}$ lin. longæ. Pedunculus sesquipollicaris, compressus. Bracteæ vix venulosæ, exteriores 6-lin. longæ. Corollæ laciniæ tubo breviores.—British Guiana, *Schomburgk, n.* 26, in the later sets.

497. P. (Bracteatæ) *amplectens* (sp. n.); glabra, foliis sessilibus oblongis acuminatis cordato-amplexicaulibus coriaceis, stipulis utrinque binis brevibus aristæformibus, cyma pedunculata umbellæformi, bracteis linearibus exterioribus flores tetrameros subæquantibus.—Frutex 2-pedalis. Folia circa 3-poll. longa, rigida. Pedunculus brevis, pluriradiatus. Bracteæ 3-lin. longæ, coloratæ. Calycis limbus brevis, dentibus 4-brevissimis. Corollæ 2-lin. longæ, albæ. Ovarium omnino *Psychotriæ.*—On the Rio Branco, *Schomburgk, n.* 879.

To the same group of *Bracteatæ* belongs Gardner's n. 1039 from Pernambuco. The species of this group with the inflorescence and usually the stipules of the true *Psychotria Paniculatæ*, have membranous or foliaceous bracts much longer than the calyx, and sometimes exceeding the corolla in length.

498. P. (Capitellatæ) *capitellata* (*DC. Prod.* iv. 514?) glabra v. junior puberula, foliis ovatis v. ovato-oblongis acuminatis basi angustatis breve petiolatis supra demum nitidis, stipulis utrinque minute bidentatis, cyma pedunculata trichotoma densa subcapitata, bracteis paucis lineari-lanceolatis corolla extus puberula intus barbata longioribus.—Folia 2-3-pollicaria. Pedunculi terminales, interdum complures, folio breviores, compressi. Flores albi, vix lineam longi, sessiles, 4-5-meri; limbi laciniæ tubo breviores. Styli laciniæ stig-

matiferæ lineari-clavatæ, pilosæ. Fructus parvus, didymus, leviter costatus.—Currassawaka, *Schomburgk, n.* 680.—Also in other collections from British Guiana.

499. P. (Capitellatæ) *polycephala* (sp. n.;) glabra, foliis ovali-oblongis acuminatis basi cuneatis subcoriaceis marginatis, stipulis utrinque binis subulatis petiolo brevioribus, florum capitulis in racemum terminalem dispositis, supremis sessilibus, bracteis lanceolatis basi latis, exterioribus corolla glabra intus barbata vix brevioribus.—Folia 2-4-pollicaria. Racemus folio plerumque brevior, capitula minora densiora quam in *P. capitellata.* Corollæ tubus tenuis, vix linea longior, limbi laciniæ tubo multo breviores. Ovarium *Psychotriæ.* Fructus non vidi.—British Guiana, *Schomburgk, n.* 139, and Rio Negro n. 942.

500. P. (Capitellatæ) *Schomburgkii* (sp. n.); tota, inflorescentia villosa excepta, glabra, foliis ovato-lanceolatis oblongisve longe acuminatis basi cuneatis coriaceis marginatis nitidis, stipulis utrinque bidentatis, pedunculis rufo-villosis apice 4-5-radiatim ramosis, cymis capitatis, bracteis lanceolatis obtusis corolla villosa intus barbata brevioribus.—Frutex, excepta inflorescentia, ex omni parte glaberrimus nitidus. Folia 3-5-poll. longa. Pedunculus foliis bis terve brevior. Capitula 3-4-lin. diametro.—British Guiana, *Schomburgk.*

501. P. (Capitellatæ) *spicata* (Coffea spicata *Humb. et Kunth.—DC. Prod.* iv. 502); tota glaberrima, foliis ovatis obovatisve vix acuminatis obtusisve crassis coriaceis marginatis, stipulis utrinque brevissime bicuspidatis, capitulis in summo pedunculo sessilibus subspicatis, bracteis ovatis obtusis.—Frutex humilis, dichotome ramosus.—Pacaraima chain, *Schomburgk.*

502. P. (Capitellatæ) *hyptoides* (sp. n.); tota, inflorescentia rufo-pubescente excepta, glabra, foliis oblongo-ellipticis breviter acuminatis basi angustatis coriaceis marginatis, stipulis utrinque vix minutissime bidentatis, pedunculis rufo-pubescentibus racemosisve subradiatim ramosis, cymis capitatis, bracteis late ovatis imbricatis corollam glabram imberbem subæquantibus.—Folia *P. Schomburgkii,* at vix nitida. Florum capitula

majora. Bracteæ exteriores 3-4-lin. longæ, latæ, concavæ, extus rufo-villosæ.—Parime mountains, *Schomburgk.*

503. Coffea *subsessilis* (sp. n.); foliis ovali-oblongis acuminatis basi cuneatis coriaceis supra nitidis subtus ad venas ramulisque strigoso-pilosulis demum glabratis, stipulis brevibus subulato-acuminatis deciduis, floribus pentameris ad axillas fasciculato-capitatis sessilibus, calycis limbo truncato obscure dentato, corollæ laciniis lanceolatis tubo brevioribus. —Frutex siccitate nigricans. Folia 2—3-pollicaria, sæpe asperula. Flores plerumque petiolo breviores. Corollæ albæ, vix 3 lin. longæ. Ovarium biloculare, loculis uniovulatis. Styli lobi stigmatiferi lineares.—Rio Negro, *Schomburgk*, n. 994.

504. C. *tenuiflora* (sp. n.); foliis ovatis acuminatis basi cuneatis subtus ramulisque puberulis, pedunculis solitariis axillaribus elongatis, floribus aggregato-corymbosis, corolla 5-fida laciniis linearibus tubo æquilongis. Frutex humilis. Folia 2—3-pollicaria, subcoriacea, supra glabra, nitida. Stipulæ latæ, breviter subulato-acuminatæ. Pedunculi 1-3-pollicares. Flores ad apicem pedunculi in capitula 3-5 sessilia v. pedunculata, aggregati. Bracteæ minutæ v. rarius sub ramis pedunculi 2-foliaceæ. Calycis limbus brevissime 5-dentatus. Corolla alba, 5-lin. longa. Antheræ inclusæ, lineares. Ovarium 2-loculare, ovulis in quoque loculo 2-adscendentibus. Fructus (in specimine immaturo) dicoccus coccis monospermis, seminibus endocarpio membranaceo inclusis.—Pirara, *Schomburgk, n.* 735.

505. C. *calycina* (sp. n.); foliis ovato-lanceolatis v. ovali-oblongis longe acuminatis basi in petiolum brevem longe angustatis, subtus ramulisque puberulis, pedunculis solitariis axillaribus v. aggregatis terminalibus, floribus aggregato-corymbosis capitatisve, calycis limbo ampliato foliaceo obscure 5-dentato, corollæ 5-fidæ laciniis linearibus tubo æquilongis. —Frutex. Folia 4-6-pollicaria. Stipulæ latæ, acutæ. Pedunculi pollicares. Flores albi, sessiles. Calycis limbus viridis, pubescens. Corolla fere glabra, 5-lin. longa, laciniis æstivatione vix contortis. Antheræ inclusæ, lineares. Ovari-

um biloculare, ovulis in quoque loculo 2? adscendentibus, uno semper post anthesin jam abortivo. Stylus brevis, stigmate obtuso. Currassawaka, *Schomburgk.*

506. C. *crassiloba* (sp. n.); glabra, foliis ovali-oblongis acuminatis basi cuneatis breviter petiolatis coriaceis nitidis, stipulis latis cartilagineis apice fimbriatis, pedunculis brevibus terminalibus apice ramosis, floribus capitato-corymbosis sessilibus.—Flores tetrameri. Calycis limbus profunde partitus, laciniis crassis obtusis subcarnosis. Corolla 4 lin. longa, alba, membranacea, laciniis oblongis, tubo æquilongis, apice dorso breviter et obtuse cornutis, revolutis, intus supra basin barbatis. Stamina exserta. Antheræ ovali-oblongæ. Stylus inclusus, lobis stigmatiferis oblongis. Ovarium biloculare, loculis 1-ovulatis.—British Guiana. *Schomburgk, n.* 199 and 363.

The genus Coffea, distinguished from *Psychotria* (where the fruit is unknown) by the æstivation of the corolla and the form of the stipules, and from *Faramea* by the ovarium, of which the cells are completely distinct, appears to contain several distinct groups and perhaps genera, but until the fruit of the several species shall be better known, it is impossible to define them satisfactorily. Gardner's Nos. 185 and 199, both from Rio Janeiro, appear to me to belong to it.

507. Faramea *corymbosa? Aubl.—DC. Prod.* iv. 496.—Iconi et descriptioni Aubletii similis, nisi folia vix coriacea, calycis limbus obscure 4-dentatus, et corollæ laciniæ vix acutæ. Ovarium 1-loculare, 2-ovulatum. Styli lobi stigmatiferi oblongi.—British Guiana, *Schomburgk, n.* 120.

508. F. *crassifolia* (sp. n.); foliis ovatis suborbiculatis breviter acuminatis marginatis crassis coriaceis, stipulis latis rigide aristatis, corymbis trichotomis terminalibus multifloris, calycis limbo brevi 4-dentato.—Affinis *F. odoratissimæ.* Folia breviora, latiora et multo rigidiora, margine crasso cartilagineo circumdata. Stipularum arista rigida, appressa, stipula ipsa vix longior. Bracteæ in corymbo subulatæ. Calycis tubus oblongo-clavatus apice constrictus, limbus membranaceus truncatus, dentibus brevibus inæqualibus acutis. Discus epigynus mag-

nus. Corollæ albæ tubus 2-lin. longus, limbi liciniæ lanceolatæ acutæ, tubo æquilongæ. Antherarum apices e tubo subexsertæ. Ovarium 1-loculare, ovalis 2 collateralibus adscendentibus dissepimento incompleto separatis. Bacca subsicca, globosa, 1-sperma, paullo major quam in *F. odoratissima*.—Dry savannahs of Pirara and the Rupunoony, *Schomburgk, n.* 811.

509. F. *longifolia* (sp. n.); foliis oblongis, acuminatis, basi plerisque cordatis breviter petiolatis, stipulis longe aristatis, corymbis trichotomis, terminalibus, axillaribusque, calycis limbo truncato obscure 4-dentato.—Affinis videtur *F. sessilifoliæ.* Folia 4-6-poll. longa, coriacea, tenuiter marginata. Stipulæ rigidæ, basi subciliatæ. Corymbi laxi, floribus in ultimis ramis terni, intermedio sessili. Bracteæ minutissimæ. Corollæ cæruleæ tubus 2 lin. longus, limbi laciniæ tubo parum breviores, obtusiusculæ. Antheræ lineares e tubo exsertæ. Ovarium incomplete biloculare. Ovula erecta.—Currassawaka, *Schomburgk, n.* 693.

The genus *Faramea*, of which the Brasilian species are numerous, may generally be known when in flower by the tenuity of the dissepiment (usually incomplete,) which separates the two ovules. Amongst Gardner's plants, the numbers 187 from Rio Janeiro, 446 from the Organ Mountains, 1693 and 1695 from Cearà, all belong to *Faramea.*

510. Siderodendron *macrophyllum* (sp. n.); foliis ovali-ellipticis subacutis basi angustatis crassis coriaceis ramulisque glabris, stipulis breviter aristatis, paniculis terminalibus trichotomis multifloris.—Arbor parva. Folia 6-8-pollicaria, petiolo brevi. Paniculæ terminales, sessiles, rarius in axillis supremis pedunculatæ. Flores ad apices ramorum 3-7, sessiles. Calyx 1 lin. longus, dentibus 4 obtusis. Corollæ tubus gracilis, 9 lin. longus, extus pubescens, limbi laciniæ ovatæ obtusæ. Stamina fauci glabræ inserta; antheræ subsessiles oblongæ, limbi laciniis breviores. Ovarium carnosum, loculis 2 parvis, ovulis in quoque loculo solitariis erectis. Stylus filiformis, lobis stigmatiferis incrassatis.—Flowers red. Sandy soil, British Guiana, *Schomburgk, n.* 467.

511. S. *laxiflorum* (sp. n.); foliis oblongo-ellipticis, acuminatis, basi rotundato-cuneatis vix coriaceis, stipulis longe aristatis, paniculis terminalibus trichotomis laxis.—Folia et stipulæ fere *S. ferrei*, a qua differt inflorescentia sæpius terminali laxiore, ramis bis terve trifidis. Corollæ tubus 7 lin. longus. An forte idem ac *S. multiflorum*, A. Rich.?—British Guiana, *Schomburgk*.

*Siderodendron* has the ovarium of *Psychotria* and *Coffea*, the stipules of *Coffea* and *Faramea*, but may be readily distinguished from them all when in flower by the long slender tube of the corolla. The erect ovules separate it at once from *Chomelia*, *Scolosanthus*, &c.

512. Chomelia *tenuiflora* (sp. n.); foliis ovatis acuminatis ad venas ramulisque pilosulis, spinis axillaribus validis, floribus in ramulis brevibus axillaribus foliatis 1-3 sessilibus, calycis limbi semi-4-fidi, laciniis subulatis, corolla extus pilosa, laciniis linearibus acutis.—Folia 1½-2-pollicaria, supra demum glabrata, nitida, axillis venarum subtus barbatis. Stipulæ basi latæ, subulato-acuminatæ. Calycis limbus tubulosus, laciniis tamen tubo longioribus. Corolla tenuis, pollice parum longior, laciniis 4 lin. longis. Stamina fauci inserta, filamentis brevibus. Ovarium biloculare, ovulis in quoque loculo solitariis pendulis.—Banks of streams, British Guiana, *Schomburgk*, *n.* 314.—This plant has the habit of *Chomelia* as well as the more important characters, but the long slender divisions of the corolla distinguish it from the other species.

513. C. *angustifolia* (sp. n.); glaberrima, foliis oblongis, obtusis utrinque angustatis, pedunculis filiformibus folio vix brevioribus trifloris, calycis limbi laciniis oblongis, obtusis, inæqualibus.—Frutex 12-15-pedalis. Spinæ in speciminibus suppetentibus nullæ. Stipulæ subulato-acuminatæ. Ramuli floriferi, breves, foliis approximatis 1-1½-pollicaribus. Flores glabri, albi v. flavicantes, odorati; tubus corollæ 4 lin. longus, limbi laciniæ 1½-lin., oblongæ, obtusæ.—Falls of the Essequibo, *Schomburgk*, *n.* 32.

Gardner's n. 1038, from Pernambuco, is very near to *C. obtusa*, Cham., but the divisions of the calyx are rather unequal

and less obtuse. Presl's *Anisomeris spinosa*, also a *Chomelia*, differs slightly from the last mentioned species in the still greater inequality of the lobes of the calyx, and in the form of the leaves broader at the base. Gardner's n. 1694 from Cearà is apparently a new species, also very near to Presl's.

The genus *Chomelia*, as well as the two following, differ from the true *Psychotrieæ* in their pendulous ovules, and should perhaps be referred to *Guettardeæ*, where De Candolle has placed *Malanea*, or possibly with some others form a distinct tribe, but of which I have not examined species enough to establish the characters at present.

514. Malanea *sarmentosa*, *Aubl.—DC. Prod.* iv. 459.—Ovula 2, pendula.—Sides of rivers, British Guiana, *Schomburgk*, *n.* 384.—This plant answers to Aublet's figure and description much better than the Brasilian plant, distributed by Martius under the n. 394 of his Herbarium Brasiliense, and referred by him to Aublet's species, but which is probably a new one.

515. Chiococca *nitida* (sp. n.); foliis oblongo-ellipticis, breviter et obtuse acuminatis, coriaceis, nitidis, racemis axillaribus binis laxis subramosis, dentibus calycinis brevissimis filamentis villosis.—Folia 3-5-pollicaria. Stipulæ brevissimæ, vix apiculatæ. Corolla 4-lin. longa, fere campanulata. Antheræ lineares, inclusæ.—British Guiana, *Schomburgk*, *n.* 1055, probably from Roraima.

Gardner's n. 1418 from Alagoas belongs to the same genus, and appears to be the *C. densifolia*, Mart.

516. Geophila *reniformis*, *Ch. et Schl.—DC. Prod.* iv. 537.—British Guiana, *Schomburgk*, *n.* 194.

517. Declieuxia *chiococcoides*, *Humb. et Kunth.—DC. Prod.* iv. 479.—Stony savannahs, Pirara, *Schomburgk*, *n.* 723.—Gardner's Nos. 1701 and 1702 from Cearà, appear to me to be mere varieties of this species.

### Tribe, SPERMACOCEÆ.

518. Diodia *scandens*, Sw.?—*DC. Prod.* iv. 563.—French Guiana, *Leprieur*, *Herb. Par. n.* 166 and 172.

519. D. *barbata, DC. l. c.?*—This agrees with Poiret's description as far as it goes. It is very near to *D. setigera* DC., and like it has remarkably costate globose fruits, but these fruits are larger, the leaves longer and narrower, and the corolla much larger, being near eight lines long.—Arid savannahs of the upper Rupunoony and Pirara, *Schomburgk, n.* 161 and 707.

520. D. *articulata, DC. Prod.* iv. 564.—Shores of the Essequibo, *Schomburgk, n.* 11.—The specimens sent in the earlier sets are precisely similar to Pohl's, those in the latter sets have the leaves broader and somewhat rough, and the flowers more numerous, yet they appear to belong to the same species.

521. Borreria *verticillata, Mey.—DC. Prod.* iv. 541.—Moist Savannahs, British Guiana, *Schomburgk, n.* 618.

522. B. *alata, DC. Prod.* iv. 544.—Caulis alæ angustæ, hinc inde ciliatæ. Capitula numerosa, ramulos axillares breves v. caules terminantia. Fructus omnino *Borreriæ.* Cætera omnia ut in icone et descriptione Aubletii.—On the Rio Negro, *Schomburgk, n.* 864.

523. B. *suaveolens, Mey.—DC. Prod.* iv. 546.—Dry Savannahs, British Guiana, *Schomburgk, n.* 250.

524. B. *sphærica, DC. Prod.* iv. 547.—French Guiana, *Herb. Par.* n. 171.

525. B. *Perrottetii, DC. Prod.* iv. 548?—Pirara, *Schomburgk, n.* 763.

The genera *Diodia, Borreria* and *Spermacoce* are certainly very closely allied in character, and do not appear, as at present constituted, to be distinguished by any peculiarities in habit. Supposing, however, their present artificial characters to be retained, Gardner's species would be distributed as follows:—55 from Rio Janeiro, 1037 from Pernambuco, 2190 and 2191 from Piauhy are *Diodiæ* of the section *Eudiodia*, 1037 being apparently a narrow-leaved variety of *D. setigera*; 445 from the Organ Mountains is *Diodia* (Dasycephala) *alata*, Nees et Mart.; 1033 from Pernambuco, and 2189 from Piauhy are the *Borreria ramisparsa*, DC.;

1036 from Pernambuco (the same species as 1707 from Cearà), 1034 from Pernambuco, 1708 and 1711 from Cearà are all *Borreria;* 2193 from Piauhy, as far as I can ascertain from my specimen, is a true *Spermacoce*, and 443 from the Organ Mountains, is too young to determine.

526. Richardsonia *divergens*, *DC. Prod.* iv. 568.—Savannahs of the Rio Branco, and near Currassawaka, *Schomburgk, n.* 630.—The Rio Branco specimen, a single one, agrees precisely with Salzmann's; those from Currassawaka are rather less hairy, but the characters are the same.

Gardner's n. 54 from Rio Janeiro, is *R. scabra*, and 1035 from Pernambuco, appears to be *R. grandiflora*, Ch. et Schl.

The same collector's n. 444, from the Organ Mountains, is a *Triodon.*

527. Mitracarpium *puberulum* (sp. n.); annuum, procumbens? foliis elliptico-oblongis lanceolatisve acutiusculis basi angustatis utrinque cauleque puberulis, stipulis multisetis ciliatis, floribus parvis dense capitato-verticillatis, capitulo terminali tetraphyllo.—In omnibus cum descriptione Chamissoniana *M. Torresiani* (ex Manilla) convenit, nisi pubescentia brevissima. Flores numerosi minimi fere ad omnes nodos. An huc referenda *Spermacoce prostrata*, Aubl.?—British Guiana, *Schomburgk, n.* 394.

528. M. *scabrellum* (sp. n.); annuum, erectum? foliis linearibus v. lineari-lanceolatis setaceo-mucronatis utrinque cauleque scabro-hirtellis, stipulis paucisetis, capitulis terminalibus et paucis axillaribus parvis, calycis dentibus 4, 2 duplo majoribus tubo corollæ brevioribus.—Herba dura, 4—9-pollicaris. Rami stricti. Folia majora pollicaria. Capitula pleraque 2 lin. diametro.—On the Rio Branco, *Schomburgk, n.* 856.

529. M. *rude* (sp. n.); annuum? erectum, foliis lanceolatis acutissimis utrinque cauleque setoso-hispidis, stipulis longe multisetis, capitulis axillaribus et terminali 4-phyllo densis, calycis dentibus 2 tubum corollæ æquantibus, 2 minutis.—Herba 1—2-pedalis. Rami parce ramosi. Folia

1—1½-pollicaria. Capitula 3—4 lin. diametro.—Savannahs, British Guiana, *Schomburgk, n.* 409.—This plant resembles much Aublet's figure of *Spermacoce aspera*, but he describes the fruit as separating into two monospermous capsules, and Schomburgk's plant is without doubt a *Mitracarpium*.

I have not any *Mitracarpium* amongst Gardner's plants, but his 1335 from Alagoas, and 2187 and 2192 from Piauhy all belong to the adjoining genus *Stælia*.

530. Perama *hirsuta* (Aubl. Pl. Gui. i. 54. t. 18); caule dense hispido, paniculato-ramoso, foliis oppositis ovato-lanceolatis v. superioribus lanceolatis, corollæ tubo dentibus calycinis breviore, laciniis limbi 4 acutis muticis.—British Guiana. *Schomburgk, n.* 100 in the earlier sets.—French Guiana, *Leprieur, Herb. Par. n.* 167.—Bahia, *Blanchet* n. 2551, *Salzmann*.

531. P. *stricta* (sp. n.); ramis strictis pilis raris strigosis, foliis oppositis lanceolatis v. superioribus lineari-lanceolatis basi ciliatis subglabris, corollæ tubo dentes calycinas superante limbi laciniis 4 acutis muticis.—Foliorum forma, corollis majoribus, glabritie et habitu a *P. hirsuta* sat distincta videtur.—British Guiana, *Schomburgk, n.* 100 in the later sets.

532. P. *humilis* (sp. n.); hispida, basi ramosa, ramis simplicibus, foliis ternis lineari-lanceolatis, corollæ tubo dentibus calycinis breviore, limbi 5-fidi laciniis setaceo-acuminatis.—Calyces majores, corollæ minores quam in *P. hirsuta*.—Roraima, *Schomburgk*, a single specimen.—The species answers in many respects to the description of *P. hispida* (Humb. et Kunth, under *Mattuschkea*,) but the corolla is different. Perama, still rejected by some from *Rubiaceæ*, is very near *Stælia*, the capsule opens in the same way in two oblique valves, but being 3-celled, each valve comprehends the upper portion of one cell and a-half.

Gardner's 440 and 441, from the Organ Mountains, are the *Emmeorhiza* Pohl. (*Endlichera Brasiliensis*, Pohl., *Machaonia Brasiliensis*, DC.) a plant very nearly allied to *Machaonia*, but probably a good genus. Gardner's n. 1336 from Alagoas, and 1600 from Ceará, are true *Machaoniæ*.

## LOGANIACEÆ.*

### Tribe, Spigelieæ.

533. Spigelia *anthelmia*, *Linn. Sp.* i. 213.—British Guiana, *Schomburgk*, *n.* 671.—French Guiana, *Leprieur*, *Herb. Par.* *n.* 200.—Pernambuco, *Gardner*, *n.* 1067.

534. S. *Schomburgkiana* (sp. n.); annua? foliis lanceolato-ovatis floralibus quaternis, spicis a basi floriferis, dentibus calycis minimi brevissimis, genitalibus inclusis, capsulis lævibus.—A descriptione *S. Flemingianæ* (*Cham. et Schlecht. Linnæa*, i. 203) differt præcipue ramis tenuibus, foliis pollicaribus, spicis vix 20-floris.—On the Essequibo, *Schomburgk*, *n.* 14.

535. S. *humilis* (sp. n.); annua, foliis lanceolatis omnibus oppositis, spicis 2—4-floris, genitalibus inclusis, calycis dentibus capsula lævi dimidio brevioribus.—Planta vix semipedalis. Folia inferiora ovato-lanceolata, suprema lineari-lanceolata, trinervia. Corolla alba, fere 6 lin. longa.—Affinis *S. Schlechtendalianæ*, Mart., at pluribus notis distincta.—On the Essequibo, *Schomburgk*, *n.* 20, on the Quitaro, n. 536, and on the Rio Negro, n. 926.

Gardner's n. 724, from the Organ mountains, appears to be an undescribed *Spigelia* with opposite leaves.

### Tribe, Antonieæ.

536. Antonia *pilosa*, *Hook. Ic. Pl. t.* 64.—*Endl. Iconogr. t.* 56.—A. pubescens, *Bong. in Mem. Acad. Petrop. ser.* vi. *v.* iii. *p.* 2. *t.* 1.—On the Essequibo, *Schomburgk*, *n.* 85, *a.*

### Tribe, Strychneæ.

537. Strychnos *toxifera*, Schomb.—*Hook. Ic. Pl. t.* 364 and 365; ramis scandentibus cirrhisque pilis longis patentibus rufis dense obtectis, foliis sessilibus ovali-oblongis acuminatis membranaceis trinerviis utrinque pilis longis rufis hirsutis, floribus . . . . . . fructibus maximis globosis.—Folia

* I here adopt this order as extended by Meisner, *Gen. Pl.*

3—4-pollicaria.—British Guiana, *Schomburgk, n.* 155.—This plant furnishes the celebrated Wourali poison, referred to by M. Schomburgk in the narrative of his expedition.

538. S.? *cogens* (sp. n.); ramis scandentibus petiolisque puberulis, foliis breviter petiolatis lanceolato- v. oblongo-ovatis acuminatis basi rotundatis coriaceis 3—5-nerviis supra glabris subtus puberulis v. demum glabratis, floribus . . . . . Folia 4—6-pollicaria.—British Guiana, *Schomburgk, n.* 156. This plant, according to M. Schomburgk, is a ligneous twiner like the Wourali, and the juice is mixed with that poison to give it consistency. On this account, as well as from the peculiar venation of the leaves, I have little hesitation in referring it to *Strychnos*, although I have seen neither flowers nor fruit.

539. Pagamea *Guianensis, Aubl. Pl. Guian.* i. 112. *t.* 44. —A small tree in sandy soils, British Guiana, *Schomburgk, n.* 510 (in some sets corrected by mistake to 467) and 985.—French Guiana, Leprieur.—This genus belongs to the tribe of the *Strychneæ*, and not to the *Gærtnereæ*, as will appear from the following description of the ovary and fruit. Ovarium breviter bilobum, biloculare, loculis multiovulatis, placentis carnosis, ovulis minutissimis, vix conspicuis. Bacca (2—3 lin. diametro) obovoideo-globosa, dipyrena v. abortu monopyrena, pyrenis unilocularibus polyspermis. Placentæ carnosæ undulatæ. Semina numerosissima, minuta, in placentis imbricata, pulpa nidulantia.

## APOCYNEÆ.

### Tribe, Carisseæ.

540. Couma *Guianensis, Aubl.—Endl. Gen. p.* 579.—French Guiana, *Leprieur, Herb. Par. n.* 100.

541. Allamanda *grandiflora, Lam. Dict.* iv. *p.* 601.—French Guiana, *Leprieur, Herb. Par. n.* 144.

### Tribe, Ophioxyleæ.

542. Rauwolfia *polyphylla* (sp. n.); glabra, foliis verticil-

latis (quinis) petiolatis oblongo-lanceolatis acuminatis basi rotundatis, pedunculis terminalibus corymbosis petiolo brevioribus.—Frutex 10—12-pedalis. Folia 4—6-pollicaria, in verticillo parum inæqualia, petiolo 8—10 lin. longo. Pedunculi 3—5, semipollicares, apice cymas corymbiformes 12—20-flores gerentes. Flores albi, odorati. Calyces *R. nitidæ.* Corollæ paullo longiores. Ovula in loculis erecta, solitaria.—Islands of the Rio Negro, *Schomburgk*, *n.* 891.

## Tribe, Plumerieæ.

543. Odontadenia *speciosa*, *gen. nov.*—On the Berbice, *Schomburgk*, *n.* 309.

Char. Gen. *Calyx* profunde 2-fidus. *Corolla* late infundibuliformis, tubo brevi, fauce ampla, laciniis limbi latis, æstivatione contorta. *Stamina* ad faucem inserta, e tubo exserta, filamentis brevissimis, antheris in conam connatis, postice bimucronatis, extus villosis. *Glandulæ hypogynæ* 5, dentatæ. *Ovaria* 2. *Ovula* numerosissima, in placentis plano-compressis dissepimento bipartiente utrinque adnatis imbricata. *Styli* 2, apice conniventes. *Stigma* conicum carnosum, inferne dilatatum. *Folliculi* (2, altero sæpius abortiente) oblongi, crassi, carnosi, endocarpio coriaceo, *placenta* lignosa mobili fructum bipartiente. *Semina* numerosissima, oblongo-linearia, in stipite brevi extremitate affixa, exalata, ecomosa, albuminosa. *Embryo* . . . . *O. speciosa.* Frutex *scandens, succo lacteo, glaber.* Folia *sparsa, semipedalia v. majora, breviter petiolata, ovali-elliptica, acuminata, basi rotundata, subcoriacea.* Pedunculi *axillares, multiflori, folio subbreviores, ramis oppositis racemoso-paucifloris.* Bracteæ *minutæ.* Pedicelli *semipollicares.* Calyces *laxi*, 4 *lin. longi, laciniis obtusis latis, glabris, margine membranaceis, aurantiaco-coloratis.* Corolla *bipollicaris, lutea fundo aurantiaco, glabra, tubo subgloboso* 4 *lin. longo, intus inter stamina piloso, limbo plus quam pollices duo diametro.* Antheræ 4 *lin. longæ, mucronulatæ, extus pilis nitentibus obtectæ, circa stigma arcte cohærentes.* Glandulæ *hypogynæ, latæ, truncatæ apice* 4—5-*dentatæ, ova-*

*rium subæquantes.*—Of this handsome plant I have but one fruit, which is above five inches long, and an inch and a half thick, tapering a little towards the extremity. The seeds are very numerous (above a hundred), an inch and a quarter long, of a brown colour, but apparently in my specimen not quite ripe, as I have not succeeded in finding a single perfect embryo in above a dozen that I have opened.

544. Tabernæmontana *grandiflora, Linn.*—Savannahs, Pirara, *Schomburgk, n.* 767.

545. T. *undulata, Vahl, Ecl.* ii. 20.—On the Essequibo, *Schomburgk, n.* 42.—A tree of 30 to 40 feet. Flowers yellow.

546. T. *alba, Mill., Rœm. et Schult. Syst.* iv. 402 ?—A single very imperfect specimen from the banks of the Essequibo, *Schomburgk.* He states it to be a tree of twenty to thirty feet, with white, rather succulent, flowers.

547. T. *longifolia* (sp. n.); foliis subsessilibus oblongis acuminatis basi longe angustatis, cymis dichotomis multifloris, corollæ tubo inflato apice constricto limbi laciniis vix longiore.—Folia 6—10-pollicaria. Cymæ bis dichotomæ. Flores albi, cymæ in quoque ramo 6—8, vel interdum numerosiores. Corollæ tubus 7—8 lin. longus.—Affinis *T. undulatæ* et forte *T. speciosæ*, Poir., mihi incognitæ.—British Guiana, *Schomburgk, n.* 41, and 292.

548. T. *odorata, Vahl, Ecl.* ii. 22.—Barcellos on the Rio Negro, *Schomburgk, n.* 951.—This answers in every respect to Vahl's description; but not quite so well to Aublet's account of his *Cameraria Tamaquerima* quoted by Vahl. The flowers according to Schomburgk are white and odoriferous.

549. T. *heterophylla, Vahl. Ecl.* ii. 22.—On the Essequibo, *Schomburgk, n.* 3; I have it also from Trinidad.

550. T. *rupicola* (sp. n.); foliis sessilibus oblongo- vel lanceolato-ellipticis breviter acuminatis basi inæquilateris, pedunculis brevibus paucifloris, calycis laciniis parvis obtusis, folliculis obovoideis lævibus.—Frutex 4—5-pedalis. Ramuli subteretes, pallidi, dichotomi. Folia 3—4-pollicaria, altero interdum minore, basi hinc angustata, hinc rotundata, subtus venulosa, nervis subparallelis utrinque læviter prominentibus.

Pedunculi communes brevissimi, pedicellis 3 lin. longis. Flores in pedunculo 4—5, albi. Corollæ tubus semipollicaris, basi parum inflatus, limbi laciniæ latæ, tubo longiores. Folliculi incurvi $\frac{3}{4}$ poll. longi.—Amongst rocks at Pedrero on the Rio Negro, *Schomburgk*, *n.* 898.

551. T. *laxa* (sp. n.); foliis petiolatis ovali-ellipticis obtusis basi rotundatis cuneatisve coriaceis obscure nervosis margine revolutis, cymis terminalibus dichotomis multifloris, calycis laciniis brevibus obtusis.—Frutex in aqua crescens (teste Schomb.). Folia 2—3-pollicaria. Inflorescentia *T. lætæ* (Mart. Gardner, Rio, n. 75). Bracteæ parvæ ovatæ. Corollæ tubus 4 lin. longus, basi parum inflatus, limbi laciniæ oblongæ, obtusæ, tubo vix longiores. Stamina inclusa. —On the Rio Negro, where the wood from its excessive lightness, is used for various purposes instead of cork. *Schomburgk*, n. 919.

552. T. *gracilis* (sp. n.); foliis petiolatis oblongo-ellipticis lanceolatisve breviter acuminatis basi angustatis venosis supra demum nitidis, pedunculis brevibus paucifloris, calycis laciniis brevibus acutis, corollæ limbi laciniis ovatis tubo gracili brevioribus, folliculis oblongo-linearibus divaricatis lævibus. —Frutex habitu fere *T. heterophyllæ*. Folia subæqualia, 3—4 poll. longa, petiolo 2 lin. longo. Pedunculus communis petiolo æquilongus. Flores 3—7, nivei, pedicellis pedunculo sublongioribus. Bracteæ parvæ, acutæ. Corollæ tubus semipollicaris, basi et medio (ad insertionem staminum) leviter inflatus. Stamina inclusa. Stylus simplex. Folliculi 1—2-pollicares, subteretes. Semina pauca, oblonga, lævia, ecomosa.—Stony ground on the Upper Essequibo, *Schomburgk*, *n.* 39.

553. T. (*sp. n.*) ?—Hotitjou of the Tarumas, a tree of from fifty to sixty feet in height, yielding a copious milky juice, *Schomburgk*.—A single specimen from the Taruma country, without flowers, but evidently near *T. odorata*, which it resembles in the branches, compressed at the bifurcations, and of a dark colour almost shining in the dry specimens; in the venation of the leaves, and judging from the

old peduncles, in inflorescence also; but the leaves are from five to seven inches long.

554. T. *sp.* ?—A tree of the first size. Juice milky and made into varnish and glue, *Schomburgk*, *n.* 168.—My specimens having no flowers, I do not describe this plant, which has all the appearance of a *Tabernæmontana*.

555. Plumeria *attenuata* (sp. n.); glabra, ramis vix incrassatis, foliis oblongis basi longe angustatis superne latioribus acumine brevi obtuso, paniculæ ramis articulatis, bracteis oblongis acutis tubo corollæ tenui parum brevioribus, deciduis.—Ramuli tenuiores quam in cæteris speciebus. Folia coriacea 6—9 poll. longa, petiolo fere pollicari. Rami paniculæ pauci, alterni, crassiusculi, foliis breviores, interdum bifidi. Bracteæ 6—8 lin. longæ. Calyx minimus. Corolla alba, tubo 9 lin. longo tenui æquali; limbus patens, laciniis obovatis tubo brevioribus. On the Padawire, *Schomburgk*.

556. Aspidosperma *excelsum* (sp. n.); foliis petiolatis ellipticis obtusis coriaceis supra nitidis subtus incanis, cyma corymbosa densa multiflora.—Arbor excelsa, trunco profunde sulcato, ramulis angulatis, glabris. Folia 4—6-pollicaria, venis impressis transversis basi parallelis. Inflorescentia et flores fere *A. subincani*, Mart., pedicelli tamen, et calyces, rigidiores. Folliculi compressi, 2 poll. diametro, coriacei, rugosissimi. Semina pauca, cum ala membranacea 1½ poll. diametro.—*Yarroura* or *Hussara* of the Indians. The wood is very valuable, and called by the colonists *Paddlewood*.—Flowers yellow.—Sandy soil, British Guiana, *Schomburgk*, *n.* 468.

557. Thyrsanthus *Schomburgkii*, gen. nov.—On the Rio Quitaro, *Schomburgk*, *n.* 556.

CHAR. GEN. THYRSANTHUS.—*Calyx* 5, partitus, laciniis ovatis, æstivatione imbricatis. *Corolla* tubo brevissimo, fauce nuda, limbo subrotato profunde 5-fido, laciniis æstivatione leviter contorto-imbricatis lanceolatis obtusis. *Stamina* 5, imo corollæ inserta. *Filamenta* brevia, filiformia. *Antheræ* introrsæ, biloculares, membrana basi bifida apice acuta aucta, circa stigma cohærentes, corolla breviores. *Ovarium* bilo-

culare, loculo quoque pluriovulato. *Stylus* filiformis, brevis; stigma conicum, breviter bifidum. *Folliculi* 2, v. abortu solitarii, lineares, subcarnosi. *Semina* plurima, oblongo-linearia, anguste membranaceo-alata, ecomosa.—Frutices *scandentes, præter flores glaberrimi, ramulis lenticellis maculatis.* Folia *opposita.* Paniculæ *thyrsoideæ, terminales v. nonnulli ex axillis supremis, ortæ, ramis oppositis, cymiferis.* Bracteæ *minutæ.* Flores *parvi, numerosi, extus puberuli.—T. Schomburgkii;* foliis ovali-v. obovato-ellipticis breviter acuminatis, pedunculis compressis, pedicellis rigidis, floribus erectis, corollis calyce triplo longioribus.—Folia 4—5 poll. longa. Corollæ flavescentes, fere 2 lin. longæ.

558. T.? *gracilis* (sp. n.); foliis ovalibus v. obovato-ellipticis acuminatis, pedicellis filiformibus, floribus nutantibus, corollis calyce duplo longioribus.—Folia 2—3-poll. longa, membranacea. Corollæ virescentes vix lineam longæ. Fructus non vidi.—Curassawaka, *Schomburgk, n.* 608.

### Tribe, Echiteæ.

559. Thenardia? *laurifolia* (sp. n.); foliis ovali-oblongis acuminatis basi rotundato-cuneatis, coriaceis nitidis ramulisque glabris, cymis brevibus axillaribus densis, floribus puberulis, laciniis calycinis corollinisque obtusis.—Frutex scandens. Folia circa 3 poll. longa, breviter petiolata, axillis venarum subtus foveolatis. Cymæ semipollicares. Flores numerosi. Corolla calyce duplo longior, 2 lin. diametro, tubo brevissimo, fauce pilosa, limbo subrotato 5-fido, extus tomento tenui canescente intus glabro, laciniis ovalibus. Stamina imo tubo inserta, filamentis basi dilatatis, antheris e fauce breviter exsertis, circa stigma cohærentibus. Stylus apice incrassatus, stigmate elongato-conico bifido. Folliculi abortu sæpius solitarii, lineares, 2—3-poll. longi, crassiusculi, curvati. Semina plura, elongata, angustissime membranaceo-alata, in speciminibus meis apice jam breviter comosa, at nondum matura. —Barcellos on the Rio Negro, *Schomburgk, n.* 953.

560. T.? *corymbosa* (sp. n.); foliis obovali-oblongis acuminatis basi rotundatis emarginatis ramulisque glabris, cymis

terminalibus corymbosis, floribus minute puberulis, laciniis calycinis corollinisque acutis.—Frutex ut videtur scandens, præcedenti affinis. Folia circa 3 poll. longa, non coriacea. Flores majores quam in *T. laurifolia*. Antheræ longius exsertæ, filamentis filiformibus. Fructus non vidi.—British Guiana, *Schomburgk, n.* 277.

561. Echites *angustifolia* (sp. n.); glaberrima, suberecta, foliis oblongo-linearibus obtusis mucronulatis margine revolutis coriaceis supra nitidis, pedunculis subspicatim multifloris, laciniis calycinis obtusis, corollis infundibuliformibus.—Specimina a vermibus exesa, speciem tamen distinctissimam demonstrant, *E. nitidæ*, Vahl, affinem. Ramuli crassiusculi. Folia ternatim verticillata, 1—1½-pollicaria. Racemi rhachis flexuosa. Pedicelli breves, crassi, in rhachide articulati. Corolla aurantiaca, fundo coccineo, sesquipollicaris, tubo tenui, fauce longa campanulata. Folliculi graciles, apice connati.—Among underwood in the sandstone regions of Roraima. *Schomburgk, n.* 1053.

562. E. *subcarnosa* (sp. n.); glaberrima, volubilis, foliis ellipticis utrinque obtusis, apice acumine brevi obtuso auctis, coriaceis, nitidis, margine revolutis, pedunculis subspicatim multifloris, laciniis calycinis acutiusculis, corollis infundibuliformibus.—A single specimen from Roraima, much injured by worms, but remarkable by the thick almost fleshy stems; the leaves two to three inches long, thick and marked with transverse parallel veins as in *Plumeria*. Inflorescence and flowers nearly the same as in *E. angustifolia*.

563. E. *tomentosa*, *Vahl*, *Symb.* iii. 44. *Ic. t.* 4.—E. hirsuta, *Rich. Act. Hist. Nat. Par.* 107.—E. Richardi, *Rœm. et Schult. Syst.* iv. 391.—French Guiana, *Leprieur*, *Herb. Par. n.* 138, also in Salzmann's Bahia collection.—This species, with the two preceding, and the two following ones, belong to a group or subgenus with the flowers almost spicate; that is, borne on very short pedicels along a simple thickened rhachis, with infundibuliform corollas, and the follicles in most (if not in all) of the species connate at the apex before they are ripe. The stamens are by some authors described as exserted,

by others as included in the tube; but this depends upon whether that part of the corolla only is considered a tube which is cylindrical, the broad upper part being then designated as the throat; or whether the whole of the corolla below the limb be included under the name of the tube.

564. E. *rugosa* (sp. n.); volubilis, ramulis junioribus scabro-puberulis demum glabris, foliis oblongis breviter acuminatis basi ad petiolum emarginatis rotundatis aut cuneatis subcoriaceis rugosis, supra scabro-pubescentibus v. demum glabris nitidis, subtus albo-tomentosis v. demum fere glabris, pedunculis incrassatis subspicatim multifloris, calycis laciniis brevibus acutissimis, corolla infundibuliformi glabra. —Folia bipollicaria. Bracteæ lanceolato-subulatæ, calycem brevissime pedicellatum subæquantes. Corollæ luteæ tubus pollice parum longior, teres, rectus, intus ad insertionem staminum pilosus, faux tubo brevior, ampla, laciniæ latæ. Stamina, uti in affinibus, in fundo faucis e tubo exserta.—British Guiana, *Schomburgk, n.* 550, in some sets.

565. E. *brachystachya* (sp. n.); volubilis, ramulis pubescentibus, foliis ovali-ellipticis obtusis mucronatis basi rotundatis et sinu angusto cordatis membranaceis, supra pubescentibus, subtus albo-tomentosis, pedunculis incrassatis subspicatim multifloris, calycis laciniis brevibus acutissimis, corolla infundibuliformi glabra.—Sent under the n. 350 with the last species, of which it may be a mere variety; but appears different in the form and consistence of the leaves, of which the veins are much less prominent, and in the short spikes. Both may possibly even be varieties of *E. symphytocarpa*, (G. T. W. Meyer), but neither agrees precisely with his description.

566. E. *macrostoma* (sp. n.); caule volubili glabro, foliis ovatis v. oblongis mucronatis basi cordatis supra glabris subtus tenuissime tomentellis, pedunculis folio longioribus apice plerisque bifloris, calycis laciniis lineari-subulatis reflexo-patentibus glabris corollæ tubo brevi tenui, fauce longissima ampla.—Affinis ex descriptione *E. domingensi*, Sw., sed calyces glabri, et corolla (teste Schomburgkio) rosea. Folia forma variabilia, nunc obtusissima cum mucrone, nunc

acuta v. acuminata, 1—3 poll. longa, membranacea, subtus tomento vix conspicuo rufescentia, tactu mollia. Pedicelli crassiusculi, 2—3 lin. longi. Bracteæ parvæ. Calyx tubo brevissimo, laciniis $1\frac{1}{4}$ lin. longis. Corollæ tubus 3 lin., faux fere $1\frac{1}{2}$ poll. longa, limbi laciniæ latæ. Stamina in fundo faucis. Pilæ ad insertionem staminum. Folliculi maturi 4 poll. longi, apice liberi.—British Guiana, *Schomburgk*, *n.* 329.

567. E. *nitida*, *Vahl*, *Ecl.* ii. 19. *t.* 13.—French Guiana, *Leprieur*, *Herb. Par. n.* 146.—This and the two following species are remarkable for the peculiar and elegant venation of the leaves.

568. E. *elegans* (sp. n.); volubilis, glaberrima, foliis ovali-oblongis acutissime acuminatis basi rotundatis tenuiter coriaceis nitidis eleganter venosis, pedunculis laxe racemosis paucifloris, laciniis calycinis obtusis corolla subinfundibuliformi glabra.—Folia circa 3 poll. longa, venis transversalibus inter nervos obliquis integris bifidisve raro anastomosantibus. Pedunculi oppositi, tortuosi, 3—6-flori. Bracteæ parvæ. Pedicelli 8—9 lin. longi, solitarii v. bini. Corollæ tubus ultra pollicaris, in faucem brevem superne ampliatus, intus ad insertionem staminum nudus; limbi laciniæ amplæ, tubo breviores. Stamina medio tubo inserta, inclusa.—Ab *E. nitida* differt foliorum forma, floribus paucioribus, tubo corollæ infra faucem longiore.—A twiner, hanging in festoons from the tops of the highest trees on the banks of the Rio Negro. Flowers yellow, red in the centre. *Schomburgk*, *n.* 965.

569. E. *coriacea* (sp. n.); volubilis, glaberrima, foliis ovali-oblongis obtusis v. brevissime acuminatis basi obtusis coriaceis nitidis eleganter venosis, pedunculis laxe racemosis paucifloris, laciniis calycinis obtusis, corolla subinfundibuliformi glabra.—Præcedenti similis, sed folia multo crassiora, venis minus prominentibus, pedunculi et pedicelli crassiores, flores minores, corollæ tubus vix pollicaris.—Pirara, British Guiana, *Schomburgk*, *n.* 738.

570. E. *tubulosa* (sp. n.); volubilis, glabra, foliis ovatis v. ovali-oblongis acuminatis basi subcordatis supra nitidulis,

pedunculis brevibus incrassatis subbifidis racemoso-multifloris, pedicellis calyce longioribus, laciniis calycinis ovali-oblongis obtusis, corolla hypocrateriformi glabra.—A descriptione *E. subspicatæ*, (Vahl) differt foliis latioribus et pedicellis 3—4 lin. longis.—Folia basi supra 2—3-glandulosa. Bracteæ parvæ. Corollæ roseæ tubus pollicaris, supra insertionem staminum paullo incrassatus, intus intra stamina pilis paucis barbatus; faux leviter constricta et obscure annulata, at non squamata. Limbi laciniæ breves, latæ, æquilateræ. Folliculi 8—10 poll. longi, maturi, liberi.—British Guiana, *Schomburgk, n.* 311.

571. Hæmadictyon *marginatum* (sp. n.); volubile, glaberrimum, foliis oblongis acuminatis basi angustatis coriaceis supra nitidis, margine subtus incrassato leviter recurvo.—Folia 2—3-pollicaria. Pedunculi folio longiores, apice racemosi, pluriflori. Bracteæ minutæ. Calyx et corolla omnino *H. venosi.*—Pirara, British Guiana, *Schomburgk, n.* 713.

572. Prestonia *latifolia* (sp. n.); foliis brevissime petiolatis late ovatis acuminatis supra pubescentibus subtus ramis inflorescentiaque rufo-lanatis, corymbis congestis, calycis laciniis tubo corollæ vix brevioribus.—Folia 4—5 poll. longa, 3 poll. lata, mollia. Corymbi breviter pedunculati, densi, multiflori. Calycis laciniæ foliaceæ, fere semipollicares, intus pubescentes, et basi squama ciliata auctæ. Corolla lutea, extus villosissima, tubo elongato conico, laciniis limbi ovatis intus glabris. Faux annulata et 5-squamata. Antherarum apices e tubo exsertæ. Squamæ hypogynæ ovario longiores, in urceolam connatæ.—Savannahs, Pirara, *Schomburgk, n.* 755.

573. A scandent *Apocyneous* plant with small hypocrateriform flowers, probably a new genus, but which I refrain from describing as the fruit is unknown.—On Indian fields, Currassawaka, *Schomburgk, n.* 599.

574. A shrubby *Apocyneous* plant, perhaps an *Ambelania*, but of which, without the fruit, I am at present unable to determine the genus.—In the Conocon Mountains, *Schomburgk, n.* 779.

(*To be continued.*)

## XIX.—*On some South African Plants.* By G. A. Walker Arnott, Esq., LL.D.

(*Continued from page* 156.)

10. The next order mentioned in Drege's catalogue, is that of the *Rhamneæ*, and of these the first genus and species is *Dovyalis zizyphoides*, E. M. This however is the same as the *Flacourtia rhamnoides* of Ecklon and Zeyher, En. pl. Afr. p. 15, and on the other hand these authors consider their plant to be that of Burchell. What Mr Burchell's plant actually is, I have not the means of ascertaining; but from the character given by De Candolle, (Prod. I. p. 256,) it is not improbable that it may be the female of *Dovyalis*. I am not aware of any analysis being yet published of this genus, and therefore add the following:—

### Dovyalis, E. M.

*Flores* dioici.—Masc. *Perianthium* profunde 5-fidum, pubescens. *Corolla* nulla. *Receptaculum* glandulis (ut in *Gelonio*) dense onustum. *Stamina* 18—20, *filamenta* filiformia, receptaculo inter glandulas inserta: *antheræ* semiglobosæ, biloculares; loculis connectivo crassiusculo disjunctis, longitudinaliter profunde unisulcatis. *Ovarii* vestigia nulla.—Fæm. *Perianthium* profunde 5-fidum, pubescens, glandulis stipitatis ciliatum. *Corolla* nulla. *Discus* annularis, carnosus, 5-lobatus, lobis perianthii laciniis oppositis. *Ovarium* liberum, basi disco cinctum, imperfecte biloculare (marginibus carpellorum oppositis introflexis vix ad axin connatis.) *Ovula* 2, in utroque loculo solitaria, appensa; funiculus hinc ovulo adnatus; chalaza infera. *Styli* duo, hinc intus sulcati. *Stigmata* minuta, truncata. *Fructus* carnosus (in exemplo suppetente semidestructus,) perianthii aucti laciniis varie flexis subulatis induratis glandulis spinescenti-stipitatis ciliatis suffultus.—Frutex *spinosus.* Spinæ *axillares, teretisubulatæ, horizontaliter patentes, in ramos juniores subpectinatæ,* 2-2½ *poll. longæ.* Folia *alterna, decidua, ovata, crenato-dentata, basi triplinervia, venosa,* 1¼ *poll. longa, breviter petiolata.* Flores

*breve pedicellati, axillares ;* masc. *plures fasciculati ;* fæm. *subsolitarii.*

That this genus can have no relation to the *Rhamneæ* must be at once apparent. In several respects it approaches to *Euphorbiaceæ*, and particularly to *Gelonium*, but if the ovarium be truly unilocular, and perhaps the furrow which is observable along the inner side of each of the styles is confirmatory of that structure, such an affinity must be abandoned. On the other hand, the very deeply introflexed margins of the ovary, and the reduced number of ovules remove it from *Bixineæ ;* while from *Flacourtianeæ* it differs by the same points, and also by having simple placentas along the introflexed margin of the ovarium, and more than one style. My own opinions lean to its being most connected with *Euphorbiaceæ*, but the habit is most that of a *Flacourtia*.

11. *Olinia cymosa*, and n. 3468, which is *O. capensis* of Klotzsch, form a group nearly allied to the Memecyleæ and Myrtaceæ, and are far removed from Rhamneæ.

12. *Helinus ovatus*, E. M. (*Willemetia scandens*, E. and Z., and *Rhamnus mystacinus*, Ait.) is admitted as a genus by Endlicher; but with the exception of the fruit being destitute of wings, I do not see how either in habit or structure of the flower, it differs from *Reissekia*, a genus retained by Brongniart as a mere section of *Gouania*, and founded on *Gouania smilacina*, Sm., (*Celastrus umbellatus*, *Flor. Flum.* II. *t.* 137, and *G. cordifolia*, Raddi.)

13. No. 9123 is a species of *Rhamnus*, and probably *R. prinoides*, L'Her. The *R. celtifolius*, Thunb., which is usually placed next this in our systematical works, is, as far as relates to *Burm. Afr. t.* 88, a species of *Celtis*, and apparently the same as that distributed by Drege under No. 8261. *b.*

14. The remaining genus of *Rhamneæ* is the Linnean *Phylica*, but from this must be excluded *Ph. abietina*, E. M. which is a species of *Spathalla*, one of the Proteaceæ, and *Ph. mucronata*, E. M., which is a species of *Stilbe*.

*Phylica*, Lin., was divided by Brongniart into three genera; *Trichocephalus* (*Walpersia*, Reiss.) with setaceous small

petals; *Phylica* with cucullate petals, and the ovary contained in the bottom of the calyx-tube, and *Soulangia* which differs from *Phylica* by the ovary filling up the whole calyx-tube. These at least are the more prominent differential characters. Reissek has further subdivided *Phylica* into *Tylanthus* which has the calyx-segments ovate and acute, and a short indistinct conical style, and *Phylica* proper with subulate calyx-segments, and a clavate or filiform style; and has added a new genus *Petalopogon*, having subulate calyx-segments, a short style, and cucullate fringed petals. Keeping these in view, I shall indicate how far Drege's specimens agree with such characters. *Ph. tortuosa* is a *Tylanthus.*—*Ph. squarrosa* agrees with all the characters of *Tylanthus*, except the calyx, the segments of which are subulate as in *Phylica.*—*Ph. bicolor* accords with *Phylica*, except that the calyx-segments are ovate and acute, as in *Tylanthus.*—*Ph. imberbis* is a *Tylanthus*, as are also *Ph. ericoides*, *Ph. parviflora*, *a*, and No. 6775.—No. 6777, *a*, is a true *Phylica.*—No. 1917, *a*, and also *Ph. Thunbergiana* are species of *Tylanthus*, but the sepals have a subulate point.—Of *Ph. cylindrica* I have no flowers.—No. 6779, which is the same as Sieber's flora mixta, No. 90, and apparently *Ph. capitata*, L. belongs to *Trichocephalus*, where also must be brought *Ph. spicata*, No. 6787, 6788 *a*, 6790, 6752 *b*, *Ph. callosa*, and *Ph. stipularis.*—*Ph. retrorsa* agrees with *Trichocephalus* in the petals, but the calyx-segments are ovate.—*Ph. plumosa*, No. 6770, 6772, *Ph. pedicellata*, *Ph. rosmarinifolia*, *Ph. parviflora*, *c*, *e*, and *Ph. oleoides*, all exhibit the characters of *Soulangia*. Besides these I may mention a species which was in Mr Harvey's first distribution, No. 202, which I had called *Trichocephalus Harveyi*, floribus capitatis, petalis apice dilatatis cucullatis margine membranaceo fimbriato, ovario glabro, ramis junioribus villosis, foliis exstipulatis angustis basi cordatis margine revoluto subtus incanis. But this must, I presume, be referred to *Petalopogon*, (and perhaps to the species already described, but the leaves are not cuspidate) although I cannot see any material character to separate it from *Tri-*

*chocephalus*, in which the linear or setaceous petals are often fringed with hairs at the apex. As to the separation of *Tylanthus* from *Phylica*, the above notes will show that it is not well-founded.

15. The *Celastrineæ* follow; and before noticing them especially, I may allude to Endlicher's genera, in which the principal character between these and *Ilicineæ* is made to consist in the structure of the ovary, and in the minute embryo of the latter and its superior radicle; while in the former the embryo is of considerable length and the radicle superior; these characters were indeed indicated by Brongniart, (*Ann. Sc. Nat.* X. *p.* 329,) but he added others, such as the absence of a disk in *Ilicineæ*, and the disposition of the corolla to become monopetalous, which restricted the order almost entirely to *Ilex* and *Prinos*. From my specimens of most of the Cape genera, about which there can be no doubt as to the order to which they belong, being almost universally destitute of fruit and ripe seeds, I cannot be perfectly certain of the genus to which they are referrible, but shall indicate such structural differences as may be useful to others occupied with the Cape Flora. But first, let me observe that Ecklon and Zeyher have divided the genus *Celastrus* into several; of the new ones generic characters are given, but no new one is proposed of the original genus, so that it is difficult to say to what species it is to be restricted, although by comparison of the others, their *Celastrus* appears to include all the Linnean *Celastri*, with a wingless capsule; the other genera having either a winged capsule or a drupe. But, however, simple as this character may be, in practice it is almost useless, from the usual absence of fruit, and similarity of habit of the whole allied genera. Endlicher in his genera unites all (except *Asterocarpus*, E. and Z., or more properly *Pterocelastrus* Meisn.) to *Elæodendron*, but such an union renders that genus too polymorphous: he further divides *Celastrus*, as proposed in the *Prod. Fl. Penins. I. Or.*, so that all the Cape *Celastri* (with the exception of *C. pyracanthus*, or *Putterlickia pyracantha*) will belong to *Catha*, Forsk., but in the generic

character, the ovarium is said to be always trilocular, whereas, in several of the Cape species, it is decidedly 2-celled, so that it is doubtful what is intended to be done with these.

I shall now take the species in the order in which Drege distributed them.—1. *Celastrus obtusus*, *laurinus*, and No. 1925, have the ovary immersed in the disk, a bifid style, stigmas flat, oval and spreading, and belong to *Scytophyllum*, E. and Z.—2. No. 6727, *b.*; here are five petals and stamens, the latter inserted between the lobes of the disk; style one, cylindrical; stigmas three, patent; ovary nearly quite immersed in a fleshy 5-lobed and crenulated disk, 3-celled; ovules 2, collateral in each cell: this I refer to *Pterocelastrus*.—3. No. 6725. Petals five, patent; style one, short and thick; stigmas three, short; ovary immersed in the disk, 3-celled; ovules 2, collateral, in each cell; the other characters nearly as in No. 6727, whence I refer this also to *Pterocelastrus*.—4. *C. lanceolatus;* this belongs to *Celastrus* E. and Z., and is perhaps *C. stenophyllus*, E. and Z.; the style is thick, stigmas two, erect, ovary seated on a 5-lobed fleshy disk, and 2-celled; the last character separates it from *Catha*, Endl., but it is nearer that than *Celastrus*, Endl.—5. *C. linearis*, Th. seems correctly named; it is very closely allied to the last species, and exhibits the same structure of flower and ovary; in both, the ovules are in pairs in each cell, and collateral.—6. *C. refracta*, E. M.; petals erect, oblong, and stamens five; ovary scarcely half immersed (nearly sessile) in a crenulated disk; style short, thick; stigmas two, emarginately 2-lobed, erect; ovary 2-celled, 4-ovuled. The leaves are opposite, and the branches acutely 4-6 angled or almost winged; hence I infer that it is *Cassine scandens*, E. and Z.; but it cannot be a true *Cassine*, if Endlicher be correct in referring that genus to *Ilicineæ*, although I have reason to entertain doubts about this.—7. *C. buxifolius:* this differs from the cultivated plant by the inflorescence much shorter than the leaves, and is perhaps rather *C. patens*, E. and Z., stamens five; ovary seated on a crenulated fleshy disk, 9-furrowed, globose-ovate, 3-celled, 6-ovuled; ovules collateral; style

almost none; stigmas 3. This is a true *Catha* of Endlicher, and has the habit of the East Indian and Senigambian species.—8. *C. pyracantha* is correctly named, and now forms the genus *Putterlickia.*—9. No. 6736 *b*, and 6737 *b*, appear to belong to *Mystroxylon*, E. and Z.; petals orbicular, and stamens five; ovary half immersed in the fleshy 5-angled disk, 2-celled, 4-ovuled; ovules in pairs, erect; style one, short, thick; stigmas entire, truncated.

16. *Cassine Capensis*, L.: this has an evident cylindrical style, stigmas 2-3 patulous; ovary seated on a 5-lobed crenulated fleshy disk, 2-3-celled, with *two erect ovules in each cell;* now Endlicher not only places this in *Ilicineæ*, but describes the ovules as solitary in each cell, and pendulous from its apex; unfortunately he does not say what species he examined, but the above is the structure of *C. Capensis;* for the specimens are accurately determined. I have seen neither fruit nor seed, so I cannot ascertain the nature of the embryo; but if it be, as I expect, similar to that of *Elæodendron*, then *Cassine Capensis* will be very nearly allied to that genus, and to *Hartagia*, if indeed it ought not to be united to the latter. Gærtner's analysis of the fruit and seed, relates only to *C. mauracenia*, of which I have not yet seen even the flowers.

17. *Hartagia.*—1. *H. Capensis;* here the disk is fleshy, 4—5 lobed, the lobes ustulate on the margin; ovary seated on the disk, 2-celled; ovules two in each cell, erect. Now Endlicher, (*Gen. p.* 1088) says the ovules are solitary, while I find them in pairs in each cell; but I quite agree with him in removing the genus from *Ilicineæ*, near to *Elæodendron.*—2. No. 6740; of this I have no flower, and the fruit is immature, but obviously a drupe; there are however four persistent calyx-segments; the venation of the leaves is very unlike that of *H. Capensis*, and agrees better with what occurs in the following.—3. *H. Thea*, E. M. Here I have neither flower nor fruit, but if, as I suspect from the specific name, this be the Bosjesman's thea of the natives, it is the *Methyscophyllum glaucum* of E. and Z. (*En. p.* 152), already referred to; that it belongs however to *Celastrineæ*, and not to *Terebinthaceæ*,

there can I think be no doubt, although supposing the character proposed by Ecklon and Zeyher really to apply to it, the genus may be new, differing from *Celastrus*, by having opposite leaves, and from *Hartogia* by the capsular fruit.

18. *Ilex crocea;* this is *Crocoxylon excelsum*, E. & Z. I find the ovary to be immersed in a 4-angled thick fleshy disk, 2-celled, with two erect ovules in each cell; style thick and conical, and the stigma entire; whereas in the generic character proposed by Ecklon and Zeyher, the ovary is said to be 4-celled and 8-ovuled, and the stigma subquadrifid. My plant does not seem to differ from *Hartogia.*—2. *Ilex flexuosa* has all the structure of *Ilex crocea*, except having five petals and stamina; the leaves also are alternate; it seems to belong to *Mystroxylon*, E. & Z.—3. No. 6745; this appears to me to differ only from *Celastrus rupestris*, E. & Z., by the somewhat smaller leaves. Calyx-segments 5, rounded, membranaceous on the margin; petals orbicular, patent; disk 5-angled; filaments 5, short and broad, persistent, inserted under the angles of the disk; anthers orbicular, with a broad connectivum at their back, by the middle of which they are attached to the filament, 2-celled, cells nearly parallel and dehiscing vertically; ovary immersed in the disk, 3-celled, with two ovules in each cell; style short and thick; stigma very slightly 3-lobed. This may belong to *Catha* of Endlicher, but differs widely in habit. I possess another species, closely allied to these, collected between Cape and Grahamstowns; this is destitute of flower, but with the valves of the last year's capsule still adhering; it is probably a mere variety with younger foliage. 4. *Ilex livida*, E. M., differs in structure from the last only by having four petals, stamens, and calycine segments; the leaves are however much larger, more lanceolate, and tapering much at the apex.

19. *Curtisia faginea* requires no observations; it is now generally removed far from *Celastrineæ.*

From the above notes it will be seen that in all the species of Cape genera usually referred to *Ilicineæ,* which I have examined, I have never found fewer than two ovules in each

cell of the ovary, and consequently that, unless the structure of the seed forbid, they all belong to *Celastrineæ*. The other species of *Cassine*, however, require to be re-examined, as I can scarcely suppose that the accurate Endlicher, if he made the analysis himself, could have mistaken the position of the ovules. As to the genera *Scytophyllum*, *Lauridia*, and *Mystroxylon*, I am unwilling to unite them all with *Elæodendron*, as the first and third of these have alternate leaves, and other characters, but which are perhaps of less value; if however they be all united, I scarcely see how *Hartogia*, and *Cassine* are to be separated.

**20.** Under the *Flacourtianeæ*, the only remark necessary is that *Kiggelaria integrifolia*, E. M., and Drege, cannot be the plant of Jacquin; it is in fact *Pappea capensis*, E. & Z.; this is considered as one of the doubtful genera by Endlicher, but there can, I presume, be little doubt of its affinity with the *Sapindaceæ*. Another curious, and apparently Sapindaceous genus was previously distributed by Drege. I allude to *Erythrophila undulata*, E. M. As no notice has been taken of it by Endlicher, and no character so far as I know yet proposed, I add the following :—

### Erythrophila, *E. M.*

*Flores* subdiclines.—Masc. *Calyx* campanulatus, obliquus, petaloideus, 5 lobus, lobis obtusis. *Petala* 4 (quintæ loco vacuo), unguiculata, submargine disci inserta; ungue calycem æquante subpiloso, angustissime lineari; limbo flaccido, oblongo-lanceolato, basi subcucullato et squama petaloidea cristato-dentata instructo. *Discus* cupulatus. *Stamina* 8, extra discum ad latus floris ubi deest petalum quintum fasciculatim inserta, adscendentia. *Filamenta* elongata, glabriuscula. *Antheræ* biloculares, basi breviter bifidæ, dorso supra basin insertæ. *Ovarium* inter staminum fasciculum et discum inserta, sterile, breviter stipitatum, 3-angulare.—Fœm. *Calyx* ut in mare. *Petala* . . . . *Stamina* (ex vestigiis) fertilia. *Ovarium* subsessile triangulare, apice rostratum et in *stylum* subulatum attenuatum, triloculare. *Ovula* in loculis solitaria.

*Fructus* inflatus? 2—3-spermus. Frutex *ramosus*. Folia *ad ramulorum apices fasciculata, impari pinnata; rachis interrupte alatus, alis anguste obovato-oblongis basi attenuatis; foliola obovata, complicata, undulata, integerrima, mucronata, basi acuta, subsessilia*. Flores *corymboso-racemosi, rubri*.

My observations on the female flower were made on a very advanced ovary; the petals had fallen away, but the filaments of the stamens remained, and presented the same appearance as in the male flower; hence they are probably fertile. The only fruit I have seen is far from mature, and is so much pressed by the process of drying that I cannot ascertain its form; the pericarp is thinly crustaceous, much larger than the seeds, and as there seems no trace of pulp I presume it is allied to that of *Cardiospermum*, and *Aitonia*, although this last genus cannot be united to the order of *Sapindaceæ*.

21. As these notes principally relate to the genera, I shall pass on to *Lythraricæ*. The only new genus here is *Tolypeuma* (*T. floridum*, E. M.), but how this differs from *Nesæa*, I cannot discover.

22. *Myrtaceæ:* of these *Jambosa cyminifera*, E. M., is a *Syzygium;* No. 5366, is *Eugenia Zeyheri*, Harv., and No. 5367, is *Eugenia? Capensis* Harv. No 3576, is *Phoberos Eckloni* (*Eriudaphus Eckloni* N. ab E.), as I have already noticed.

23. *Loaseæ:* the genus *Cnidone* (*C. mentzelioides*, E. M.) is, I am informed by my friend Mr Bentham, the same as *Fissenia* (*F. arabica*) Brown mst.

24. *Onagrariæ* require no remark, farther than *Vahlia* is now removed to a very different order.

25. *Bruniaceæ;* on the genera of this order few alterations have been made since these genera were determined by Brongniart, but it nevertheless appears to me that some modifications are required. *Raspallia* is described with a perfectly free ovarium, upon the lower half of which the petals and stamens are inserted; now in the original species, *R. microphylla*, the lower half of the ovary certainly does cohere with the calyx-

tube; but by immersion and maceration in hot water, previous to examination, the ovary usually becomes detached, carrying with it the lower half of the disk, to the upper edge of which the stamens and petals are attached; thus the difference between *Raspallia* (if, as I think, the fruit is diœcious) and *Berardia*, is weakened, and the principal character must depend on the free petals of the former, and the gamopetalous corolla of the latter; I therefore remove *Ber. phylicoides* to *Raspallia*. *Thamnea* and *Audouinia* are separated by Brongniart, the one being said to have a 3-celled and the other a 1-celled ovary; of *Thamnea* I have seen no specimen, but I am inclined to suspect, from an examination of *Audouinia*, that Brongniart may have overlooked the dissepiments, and that it does not essentially differ from the latter, except in having five instead of three cells, which is here of little importance; that other botanists entertain a similar opinion I may perhaps be allowed to infer, from having received a specimen of *Audouinia capitata* from my friend Mr Bentham, under the name of *Thamnea multiflora*. *Brunia* has been divided by Brongniart into two sections, one of which has been separated by Ecklon and Zeyher under Thunberg's name of *Beckea;* but their *B. virgata*, with the habit of *Brunia*, has the character of *Beckea*, and is left by Ecklon and Zeyher in their restricted *Brunia*, with which it does not agree in the structure of the flower; it is therefore preferable again to unite them. I shall here give a *clavis analytica* of the genera of the order :—

I. Calyx 5-cleft.

A. styles 2, or 1 divided to the middle; ovary 2-celled.

Fruit indehiscent, 1-seeded: petals not clawed . . 1. *Brunia.**
Fruit dicoccous.
Ovary 2-ovuled,
Petals free, sometimes convolute, . 2. *Raspallia.*
Petals cohering into a tube at the base, 3. *Berardia.*
Ovary 4-ovuled, petals free, convolute, . . 4. *Linconia.*

* *Brunia* however has not the fruit always truly indehiscent: in one species I examined, it splits in a septicidal manner, the cells gaping at the apex like a coccus.

B. style simple; calyx adherent.

Ovary 1-celled, 1-ovuled, . . . . . . 5. *Berzelia.*

Ovary 2-celled, 2-4-ovuled,

Petals cohering at the base into a tube; fruit dicoccous, anthers sessile in the throat, . 6. *Gravenhostia.*

Petals free: calyx-segments more or less callous at the apex.

Ovules 2; style 2-furrowed; petals sessile lanceolate; fruit dicoccous, . 7. *Staavia.*

Ovules 4; style conical; petals clawed; fruit spherical, indehiscent, . . 8. *Tittmannia.*

Ovary 6-10-ovuled; calyx-segments large, imbricated, scarious.

Ovary 3-celled, 6-ovuled, style trigonous, . 9. *Audouinia.*

Ovary 1- (or 5-?) celled, about 10-ovuled, style cylindrical. . . . . . . 10. *Thamnea.*

II. Calyx 10-cleft; five teeth shut and obtuse, 5 alternate ones elongated, flat, dilated and truncated: styles 2 connate at the base. . 11. *Heterodon.*

Of Drege's specimens, I refer the following to *Brunia: B. verticillata* (*B. virgata* Brongn.,) No. 6856. *b*, *B. Racemosa*, No. 6854. *c.* and *B. macrocephala:* as also *Bernardia lævis*, and perhaps *Linconia tamariscina.* To *Staavia, St. glaucescens*, No. 6873, *a*, and *St. radiata.* To *Berzelia; B, lanuginosa*, No. 6863, 6864, 6862, *c*, and 6857. *a.* To *Raspallia; R. teres*, No. 6868, *R. angulata*, *Brunia phylicoides*, *Br. capitellata*, and perhaps *Br. villosa:* this last has the habit of the second section of *Brunia*, but the stamens are included: the structure of the ovary is as in *Raspallia.* To *Tittmannia* belongs *Brunia lara E.M.* and apparently also of Thunberg. Under *Berardia* ought to be brought *Brunia paleacea*, which indeed is the type of that genus. From the whole order must be excluded *Raspallia* No. 6869, which is *Griesbachia incana*, one of the *Ericineæ.*

26. *Passifloreæ.—Modecea septemloba* E. M., is *Ceratosicyos Eckloni* N. ab E.; a genus, which with *Acharia*, has been already commented upon in the *Annals of Natural History*, III. p. 420.

27. *Cucurbitaceæ.* There are only three worth noticing: the one is *Momordica quinqueloba*, which is a species of *Cephalandra*, and apparently *C. quinqueloba*, Schrad.; another is *Bryonia grossulariæfolia*, E.M., which is a species of *Coniandra.* The third is *Bryonia scabra:* this belongs to *Pilogyne*, *Schrad.*, and probably *P. Eckloni*, Schrad.; it has the stigma nearly as described in that genus. But the *Bryonia scabra, variet.* E.M. has the style trifid, and the stigmas precisely as in *B. dioica;* it nevertheless seems to be *Pilogyne velutina*, Schrad.* Now this induces a question,—is *Pilogyne* a good genus? If it is to be retained, the character must not depend on its being diœcious, nor on the stigmas or style, but on the filaments being dilated at the apex into a cordate connectivum along the margin, of which at the back are placed the linear straight (i. e. not flexuose) cells: whereas *Bryonia* would be restricted to those with the anther-cells placed along the back margin of a sinuated and lobed connectivum. In both genera the style is surrounded at the base with a thick annular fleshy, usually lobed disk. To *Pilogyne* in this extended sense (style entire or trifid; stigma one pileate, or three flabelliform and horizontal,) would then belong to the above mentioned *B. Scabra* Var. of Drege; also *B. Maysorensis*† herb. Madr., *B. Hookeriana*‡ W. and A., *B. umbellata*§ herb. Madr., and probably some others from

* This division of the genus, or subgenus, had been previously described by Endlicher, under the name of *Zehneria.*

† *B. Maysorensis.* MALE: filaments 3, dilated at the apex, leaving along each margin a linear one-celled anther; the whole resembling a round 2-celled one: there is a fleshy gland at the bottom of the perianth. FEM.: style trifid at the apex with stigmas as in *Bryonia*, arising from a fleshy disk.

‡ *B. Hookeriana.* MALE: filaments 3, dilated at the apex, bearing a linear 1-celled anther on each margin at the back, the whole resembling a reniform 2-celled anther: bottom of the perianth with a gland. FEM.: as in *Br. dioica.*

§ *B. umbellata.* MALE: filaments 3, dilated at the apex into a large flat reniform body, having the linear anther-cells along the margin at the back: apparently no gland in the bottom of the perianth. FEM.: style arising from a 5-lobed and lacerated gland, entire: stigma large, pileiform, 3-lobed, sometimes 3-partite.

East India: while the only instance of *Bryonia*, in the *Prodr. Fl. Penins. I. O.*, would be *B. laciniosa** Linn. But if *Bryonia* is to be broken down, the other species must be disposed of. Thus *B. scabrella*, Linn. has the style arising out of a fleshy disk as in *Bryonia* and *Pilogyne;* it is undivided, and has three ovate erect stigmas more or less united together; but the male flower has all the anthers united, the cells posticous, linear, and straight: it thus approaches *Cephalandra*, but then the anthers are gyrose. In *B. tubiflora*, W. and A. (of which the male only exhibits flowers in my specimens) there are three slender filaments, with the anthers cohering into one conical mass covered on the outside with slender linear anfractuose anther-cells; it thus also approaches to *Cephalandra*, but the tube of the perianth is slender and long: not having seen the male of *Cephalandra*, I am uncertain whether the stamens be united or free at the apex; they are however united at the base, according to Schrader. *Br. rostrata*, Rottl. belongs yet to another group: here the style is entire, stigma large, deeply lobed, lacerated, and recurved; anthers three, anticous, nearly sessile with the connectivum produced beyond them at the back into a short beak. *Br. epigæa*, Rottl. has a similar style, but my male specimens are not sufficiently perfect for examination. Now if we adopt Schrader's tabular view (Linn. xii. p. 403,) *B. rostrata*, *epigæa*, and *deltoidea*, Arn., would form a new genus (*Aechmandra*) between *Coniandra* and *Cyrtonema; B. tubiflora* would form another (*Gymnopetalum*,) near *Trichosanthes;* and *B. Scabrella* would not agree with any of his sections, but might be placed under the name of *Mukia*, in a section intermediate between those to which *Pilogyne* and *Bryonia* belong, in which last the anther-cells are flexuose, gyrose, or anfractuose.

28. Among the *Coniferæ*, we find inserted *Ophiria stricta*, L., with which it has certainly no affinity. This genus is entirely

* *B. laciniosa*. Anther-cells anfractuose or rather sinuose along the margin (at the back) of the sinuated dilated apex of the filament: there is no gland in the bottom of the perianth.

omitted by Mr Harvey in his genera of South African plants, and by Sprengel in his genera. It was founded on a plant of Burmann's, and appears to me from the short original description given of it, and the remark that it is similar to *Grubbia*, to be precisely that genus. Both are said to have a 2-valved, 3-flowered involucre, and 4 petals; but *Ophiria* is said to have a superior corolla, *Grubbia* an inferior one. Now whether the segments of the perianth be so called, or are petals, they are nevertheless superior; and therefore the character of *Ophiria* agrees better with specimens of *Grubbia* than that by which the latter was described. The original *Ophiria stricta*, L., may indeed be considered as identical with *Grubbia rosmarinifolia*, Berg.* Lamark, however, in his "Illustrations de Genres," t. 293, has figured a very different plant under the name of *Ophiria*, while the description given in the *Encycl. Methodique* (except the portion relating to the leaves and fruit,) is derived from the previously published character. The *Ophiria* of Lamark, or that figured by him, is by the French botanists denominated *Ophiria*, although they do not seem to be aware that it is not the original one; as however the latter must be united with *Grubbia*, there can be no difficulty in retaining *Ophiria* for Lamark's plant. *Ophiria stricta* of Drege's collections is that of Lamark. Endlicher in his genera, has very correctly united the Linnean *Ophiria* to *Grubbia*, but has unfortunately cited also Lamark's figure, and in addition given such a character to the genus, taken partly from the one, partly from the other, as applies to neither. Klotzsch in the *Linnæa*, XIII. *p.* 379 has given a new generic character to *Grubbia*, and described a new genus *Strobilocarpus* without being aware that this last was the *Ophiria stricta* of Lamark, with which however his only species, *S. diversifolius*, is identical.

* To this belongs *G. rosmarinifolia* of Drege's last distribution, and also, as appears to me, his No. 8161: the *G. hirsuta* E.M. seems to be distinguished by being much more hairy, indeed almost villous, and the branchlets which bear the leaves being very short, so that the leaves seem nearly to be fascicled.

Having endeavoured to elucidate the synonyms of these plants, I shall advert to the structure of the ovary and their place in the system. Endlicher states the ovary to be 1-celled, with 2-3 ovules suspended from the apex of a free central placenta. Klotzsch gives the same structure to the ovary, but attributes only one ovule to *Grubbia*, and two to *Ophiria.* Endlicher with doubt, and Klotzsch with certainty, refer them to Santalaceæ, and were there indeed a free central placenta, such an affinity would be at once acknowledged; but my examination leads to a different conclusion.

In neither genus can I discover the least trace of a genuine free central placenta. But M. Decaisne in an excellent memoir on these and other plants in the 12th volume of the new series of the *Ann. des Sc. Naturelles*, observes: "Hitherto the ovary of *Grubbia* has been described as unilocular; nevertheless, on examining the flower before or even at the period of its expansion, we see the ovary divided into two portions by a thin and membranous dissepiment at the summit, and on each side of which is suspended an anatropal ovule; afterwards one only of these ovules becomes developed, pressing the dissepiment against one of the sides of the ovary cell. In *Ophiria*, this structure is observable in the ovary, and resembles exactly that described and figured by M. Brongniart in the genus *Berzelia*, belonging to the *Bruniaceæ*."

My observations on these genera do not precisely coincide with those of Decaisne; but in both there is a decided tendency towards a bilocular ovarium. In *Ophiria*, the dissepiment I have always found to be imperfect, and attached only to the one side of the cell, constituting an elevated internal ridge: there is one pendulous ovule from each side of this dissepiment or ridge, at the apex. In *Grubbia* I also find constantly two ovules; and although I have never been so fortunate as detect the complete membraneous dissepiment mentioned by Decaisne, I find a free very small and thin membrane separating the ovules, which are pendulous from its apex; and along each side of the inner surface of the ovary are two slightly elevated lines, to which it is highly probable the membrane was attached in

a very early state; this loosened septum must be what had been previously supposed a free central column, but while it is detached from the sides, its connexion with the base is also interrupted, so that it soon adheres only to the apex of the ovarium.

The seed has not been seen by Klotzsch or Endlicher. I find it to contain in *Ophiria*, a small green cylindrical embryo at the upper end of a copious fleshy and somewhat oily white albumen; I have not the seed of *Grubbia:* Decaisne however attributes the above structure to both genera. I quite agree then with that botanist when he says that these two "have been improperly classed among the *Santalaceæ;*" and with Mr Harvey that the structure of the anthers relates them to *Hamamelideæ*, or as I had the pleasure of indicating to Mr Harvey, that they form a small group intermediate between that Order and *Bruniaceæ*, but most allied to the latter. It is indeed with *Bruniaceæ* that M. Decaisne also allies them, an affinity which would be still more decided if his analysis of the ovary were to prove correct.

Endlicher, Klotzsch, and Decaisne, state these genera to be without petals. Harvey in *Grubbia* describes what they call the segments of the perianth, as petals. In both I find the calyx truncated, and the petals (4, or sometimes but rarely 5 in *Ophiria*), inserted within the margin of the calyx that is continuous with the inner but not with the outer surface of the calyx; these touch each other, but scarcely cohere at the base, are valvate in æstivation, and deciduous. To this group I long since proposed to Mr Harvey to give the name of *Ophiriaceæ*, in preference to *Grubbiaceæ*, for reasons obvious to an English ear; its place would be towards the end of the class *Discantheæ* of Endlicher.

I have only further to add, that Endlicher states the stamens to be placed in pairs before the segments of the perianth (petals); while Klotzsch observes them to be on a double row, "exteriora sublongiora perianthii laciniis opposita, interiora subbreviora cum iisdem alterna." I cannot discover that they are so placed, and moreover if any are longer than

the others; but there is scarcely any difference in that respect: they are those which alternate with the petals, such being exactly the reverse of what has been described by Klotzsch. Those opposite to the petals are slightly attached to their base, while the alternating ones serve to connect the bases of the petals in the state of æstivation; a cohesion, however, which is very slight, and soon destroyed by the expansion of the flower.

29. Of the "incerti sedis," of Drege's catalogue of February, 1838, I do not possess his *Laurophyllus capensis;* the true plant approaches most to *Terebinthaceæ*, while in Drege's catalogue for 1840, his plant is placed at the end of *Laurineæ*, along with No. 2311, which however is *Trichocladus crinitus*, Presl, one of the *Hamamelideæ*. Mr Harvey's character of this genus is so different from that given by Endlicher in his genera, that some explanation is necessary. Mr Harvey seems to have examined only the male flowers with a sterile ovary; while Endlicher, and I have corroborated his analysis, examined the female or rather a bisexual flower. Moreover, the plant analyzed by Mr Harvey is probably a different species from that of Endlicher; Mr Harvey's has leaves slightly cordate at the base, acute, and very hairy underneath; this is No. 625 of Zeyher's collections from the forests of Adow and Krakakamma in the district of Uitenhage, and appears to be *T. crinitus*, E. and Z., but not I think of Thunberg. Thunberg describes and figures his plant with acuminated leaves, which are also acute at the base, and pale underneath; this is No. 2311, b. of Drege above referred to, and I have the same collected between Cape and Grahamstown; this I believe to be *T. ellipticus*, E. and Z. In this last, even the male flowers have the calyx only 5-lobed, and by no means cleft to near the base,—a structure alluded to perhaps by Ecklon and Zeyher in the following words, " Calyx cupuliformis, exacte 5-dentatus."

30. No. 8262 of Drege, is *Polpoda capensis*, Presl, or *Blepharolepis Zeyheriana*, Nees ab Esenb. in Lindley's *Int.*

*p.* 442; this genus is entirely omitted by Mr Harvey; it belongs however to the *Portulaceæ*, where it is arranged by Fenzel and Endlicher. I have strong reasons for thinking this is the *Herniaria lenticulata* of Thunberg (not of Linnæus, which according to Vahl and Smith, is *Cressa cretica.*). It is also No. 26 of Sieber's *Flora Mixta.*

The above observations relate to Drege's distribution at the end of 1838, and beginning of 1839. There are however some other Cape genera on which I have made a few notes, which I shall here add.

*Cycloptychis*, E. M.—This genus of *Cruciferæ*, has the petals as in *Brachycarpeæ;* the silicule (but not nearly mature in my specimen), is orbicular-ovate, acuminated with the persistent elongated conical style, somewhat compressed and nucamentaceous. I suspect it is quite indehiscent; the valves are furnished with a keel along their middle, which is more prominent in the middle and provided with several elevated wrinkles radiating from that point. The septum is somewhat bony and orbicular. Ovules solitary in each cell. Embryo (which I have only seen in the advanced ovary with unripe seeds), has linear accumbent cotyledons, not at all spiral, but rather bent back towards their apex. It may perhaps be placed among the *Spirolobeæ*, nucamentaceæ latiseptæ, but I prefer making a small group for it, in which case, *silicula nucamentacea latisepta cotyledonibus linearibus* will suffice both for a sectional and generic character.

*Cavanilla*, Th., or *Moldenhauera*, Spr.—The species before me is No. 680 of Zeyher's Uitenhage collections, and was found in the forests of Krakakamma; it is obviously likewise that mentioned by Mr Harvey in the note at p. 140 of his Genera, and appears as he says to differ from the original species (*C. scandens*, Th., or *M. scandens*, Spr.), by the acute instead of obtuse leaves. I have not seen the male flowers, but the following analysis of the female may not be unacceptable.

MOLDENHAUERA. *Spr.*

*Cavanilla*, Thunb.

*Flores* dioici.—FŒM. *Perianthium* simplex 4-(vel rarius 5-) partitum, segmentis oblongis obtusis. *Stamina* sterilia 4-(nunc 5), brevia, hypogyna, perianthii laciniis alterna. *Ovarium* cylindraceo-oblongum, perianthii longitudine, dense setosum, setis erectis adpressis, uniloculare. *Ovula* duo, ex apice loculi pendula, unum subsessile, alterum funiculo crasso instructum. *Stylus* nullus. *Stigma* peltatum, concavum, radiatim multi-(sub. 9-)-partitum.—Frutices: *caules volubiles, ramosi, hispiduli.* Folia *alterna, exstipulata, petiolata, hirsuta, subtus molliora, nervo medio venisque primariis subtus albis, subangulato-lobata vel grosse dentata.* Racemi *axillares, pedunculati, breves, pauciflora.* Pedunculi *petiolum æquantes.* Pedicelli *breves in axilla bracteæ parvæ sitæ.* *Setæ* (præcipue ovarii) rigidi, fragiles basi subbulbosi.

There is no order with which I can satisfactorily point out that this genus has any affinity. In many respects the leaves resemble those of some *Loaseæ*, and *Turneraceæ;* but the perianth being perfectly free from the ovary removes it from the former, and with the latter there is little resemblance. The ovules being in pairs forbid its being placed in *Urticeæ*, with which Mr Harvey is disposed to ally it, but it may be conveniently placed in that neighbourhood until the male flowers and fruit be known.

*Trichilia Ekebergia*, E. M., is a genuine species of *Ekebergia*, as restricted by Adr. de Jussieu in his valuable memoir on the *Meliaceæ*. It chiefly differs from my specimens of *Ekebergia capensis*, Sparm. (or *Trichilia capensis*, Pers.,) by the larger size of the foliage and panicles; but that may be the effect of accident. In *T. capensis*, which is in Zeyher's Uitenhage collection, No. 559, the ultimate branches are almost destitute of leaves except at the apex, but are covered with numerous tubercles from which the previous leaves seem to have fallen off.

*Pentameris* E. M., of which there are two species, *P.*

*macrophylla*, and *P. microphylla*, I cannot distinguish from *Lebretonia*, now united to *Pavonia* by Endlicher.

Among *Rubiaceæ* Drege has some new genera, *Alberta*, (described by Endlicher in his genera, p. 565, but more fully by E. Meyer in the Linnæa xii. p. 258,) a genus not far from *Mussænda; Carpothălis* E. M., a genus near *Coffea*, if not the same as De Candolle's second section, *Crocyllis*, and *Lagotis*. These last two belong to the group *Anthospermeæ;* the first of them appears to be congener with *Anthospermum Lichtensteinii* Cr., while the other is identical with *Anth. spermacoceum* Reich. Of the *Anthospermeæ*, and closely allied to *Coprosma*, I possess what seems to be an undescribed genus, found by Bridges (No. 762) in fields near Valdivia in Chili: it may be called and characterized shortly thus:—

### Leptostigma.

*Calyx* 4-dentatus. *Corolla* tubulosa, 4-fida. *Stamina* 4, didynama, duobus longioribus exsertis. *Stigmata* duo, hirsuta, elongata, filiformia.—Suffrutex *pusillus, radicans, glaber.* Caules 2—3-*unciales.* Folia *rotundo-ovata, obtusa, petiolata, margine ciliato-scabra; petiolis basi ope stipularum brevium truncatarum connatis.* Flores *terminales, solitarii ternive subsessiles.*—Differta *Coprosma* corolla tubulosa, staminibus inæqualibus, et habitu.

In concluding these remarks on some of the Cape Genera and species, in the course of which I fear I have made several unnecessary and tedious digressions, I cannot resist expressing my regret that more care has not been bestowed on the determination of Drege's superb collections. It is well known that Ecklon and Zeyher not only brought to Europe a rich harvest of Cape plants, but that a great portion are named and described in their *Enumeratio plantarum Africæ Australis extratropicæ:* the descriptions however are short, and even omitted entirely when the species is not new; so that without an actual comparison the identity of Drege's specimens, with those of Ecklon and Zeyher, cannot be made out. This however the subscribers to Drege's plants had some right to ex-

pect; but on the contrary, as the *Leguminosæ* and *Umbelliferæ* show, no pains have been taken to refer them to Ecklon and Zeyher's already published species, while new names have been given frequently to the same genus. An interchange of specimens between these collectors, would have been beneficial to both parties, as well as to those who have received a portion of them.

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## XX.—*On the* Cucurbitaceæ. By G. A. Walker Arnott, Esq., LL.D.

In the preceding paper on Cape plants, I took the opportunity of making a few remarks on *Bryonia*, relatively to Schrader's new arrangements of the genera of this order. This has been published in the *Linnæa* xii. p. 401, but from the circumstance of characters not being added to the genera, except in one or two instances, the conspectus cannot be of much use to the Botanist. My intention is here to exhibit Schrader's subdivisions, and to give short generic characters: in doing so, I shall adopt as far as possible Schrader's definitions, form new sections, and break up the old genera when requisite, so as to carry out his method. I do not however express my own opinion as to the propriety of these dismemberments, further than that they will bring to view differences of structure of considerable importance in this extremely difficult order.

One genus introduced here by most Botanists as well as by Schrader, I exclude without any hesitation from the whole order; I mean *Erythropalum* of Blume: this I have not seen, but from an attentive examination of the description in Blume's *Bijdragen*, p. 921, I have no doubt of its intimate affinity with my *Mackaya*, published in No. 12 of the *Magazine of Zoology and Botany*, if indeed the two genera, and perhaps the species, be not identical. *Allasia* of Loureiro is very imperfectly known; perhaps it is the same as *Telfairia* or *Joliffa*, but very inaccurately described. *Myrianthus* P. B. has surely no connexion with the order. *Turia* Forsk., is

probably made up of different genera, but chiefly belongs to *Luffa*. *Thladiantha* of Bunge is as yet imperfectly described as to the insertion of the stamens, but may possibly form a distinct tribe. *Zucca* and *Kolbia* are too obscure to permit me to hazard any conjecture upon them. *Gronovia* can scarcely belong to the *Cucurbitaceæ*. I shall enumerate the species which I myself possess, and a few others which also I have examined.

CUCURBITACEÆ, Juss.

Div. I. Cirrhis axillaribus.

Trib. I. NHANDIROBEÆ. *St Hil.*—Flores dioici. Calyx 3? vel 5 fidus. Stamina 5, distincta vel basi connata, interdum totidem sterilibus alternantia. Antheræ didymæ biloculares et apice filamentorum adnatæ. Fructus triloculares indehiscens, placenta (axi) centrali: ovula erecta.

1. *Feuillea* Linn.:—Calycis fem. limbus semisuperus, ovarium semi-inferum. Bacca globosa, medio limbi calycini cicatrice zonata. Semina submarginata. Antherarum loculi longitudinaliter dehiscentes.

1. *F. trilobata* Lin.

2. *Zanonia* L.—Calycis fem. limbus superus, ovarium inferum. Fructus elongato-turbinatus v. hemisphæricus superne calyci cicatrice zonatus. Semina alâ foliaceâ magnâ cincta, vel testa crassiuscula rugulosa. Antheræ loculis secus apicem rima transversali dehiscentibus, itaque pseudo-uniloculares.*

1. *Z. Indica*, L. 2. *Z. Wightiana* Arn.

* De Candolle, Endlicher, and most other Botanists, ascribe to this genus a 3-lobed male calyx, a 5-partite corolla, and unilocular anthers. In all the species I have examined, the male calyx is 5-cleft, (although in *Z. Indica* the lobes often cohere in pairs,) and the anthers are as above described. In *Z. Indica* the petals are connected at the base, but in *Z. Wightiana* a species from Ceylon, (foliis trisectis, segmentis breve petiolulatis ovato-lanceolatis remote serratis, racemis masculis compositis folium subæquantibus, caule flexuoso filiformi glabro, floribus minutis,) the petals are quite distinct, agreeing in these respects with *Z. sarcophylla* Wall. Fl. As. Rar. t. 133, which also has bilocular anthers, and a 5-cleft male calyx. I have some doubts if *Z. Wightiana* be really distinct from *Z. laxa*, Wall.; the habit of the two is the same, except that in the latter the leaves are usually

Div. II. Cirrhis lateralibus.

Trib. II. *Telfairiæ, Endl.* (Joliffieæ, *Schrad.*)—Flores dioici. Calyx 5-fidus. Stamina 5, versus basin corolla inserta, basi triadelpha. Antheræ laterales rectæ. Ovarium e carpidiis 3—5 compositum, carpidiorum marginibus seminiferis intra loculum porrectis, parietem haud attingentibus. Semina plurima, nucamentacea, horizontalia, parietem spectantia.

3. *Telfairia*, Hook. (Joliffia, *Boj.*—Ampelosicyos, *Pet. Th.*)

1. *T. Pedata,* Hook.

Trib. III. Cucurbiteæ, *Schrad.*—Flores monoici, rarius dioici, rarissime polygamo-monoici vel hermaphroditi. Calyx 5-fidus vel 5-dentatus. Stamina 5, rarius 3 vel 2, corollæ inserta, libera vel varie cohærentia. Antheræ nunquam annulares. Ovarium e carpidiis tribus rarius duobus compositum, carpidiorum marginibus intra loculum revolutis parietem attingentibus. Semina plurima, vel pauca, "placentarum divisionibus exterioribus (*Cucurbita*, *Lagenaria*, *&c.*,) vel angulis loculamentorum externis (*Cucumis*) affixa, rarius dissepimentis per maturitatem evanidis velut parietalia." *Schrad.*

Sect. 1. *Filamenta 5, fauci inserta. Antheræ liberæ vel 3-adelphæ, anticæ, rectæ, uniloculares.* Fructus baccatus, oligospermus.

4. *Coniandra*, Schrad.—Corolla 5-partita. Anth. connectiva conniventia oblongo-conica. Fructus rostratus.

1. *C. grossulariæfolia* (*Bryonia grossulariæfolia*, E. M.); *hujus antheræ oblongæ.*

5. *Cyrtonema*, Schrad.—Corollæ limbus 5-partitus. Filamenta incurvata 5; connectiva incrassata 3-adelpha, antheris sub apice lateraliter affixis, oblongis. Fructus rostratus.

pedately divided into 5 leaflets, and Dr Wallich describes the stem as furnished with a double row of hairs, which however in the only specimen I have seen as not perceptible. In *Z. cissoides*, Wall., of which I observe a female specimen in Sir W. Hooker's herbarium, the ovarium is hemisphærical, 3-celled, each cell with only one ovule; the fruit is globular, about the size of a small pea, and contains two or three seeds, which have a thickish regular testa, slightly compressed, but destitute of a wing or margin. I have not seen the female flowers or the fruit of the other species with compound leaves, but it is probable that some may agree with *Z. cissoides*, in which case they may justly form a distinct genus.

Sect. 2. *Filamenta triadelpha, tubo inserta. Antheræ laterales, rectæ, 3-adelphæ, vel omnes cohærentes.*

6. *Sicydium*, Schlecht.—Corolla 5-petala, petalis indivisis. Filamenta 3-adelpha, apice dilatata et incurvata; antheræ muticæ, triadelphæ.

7. *Bryonopsis.*—Corolla 5-partita, lobis obovatis integerrimis undulatis. Filamenta 3-adelpha, fauci inserta; antheræ muticæ triadelphæ. Stigma fimbriatum. Bacca oligosperma.

1. *B. Courtallensis.*

8. *Aechmandra.*—Corollæ lobi indivisi. Filamenta 3-adelpha, brevissima; antheræ triadelphæ secus connectivi margines antice insertæ lineari-oblongæ, connectivo dorso ultra antheram in rostrum breviter producto. Fructus baccatus, (semper?) rostratus.

1. *Æ. rostrata* (*Bryonia rostrata*, Rottl.)—2. *Æ. epigæa* (*Br. epigæa*, Rottl.)—3. *Æ. deltoidea* (*Br. deltoidea*, Arn.)—4. *Æ. n. sp.* ex insula Ceylana.

9. *Melothria*, Linn.—Corollæ lobi indivisi denticulati. Filamenta 3, connectivo mutico. Antheræ biloculares triadelphæ. Fructus baccatus, erostris.

1. *M. pendula*, L. (*Bryonia Guadalupensis*, Spr.)

10. *Ceratosanthes*, Schrad.—Filamenta 3. Antheræ triadelphæ. Corollæ lobi lineares bifidi.

11. *Apodanthera.*—Antheræ monadelphæ, sessiles. Corollæ lobi integerrimi. Calyx tubulosus.

1. *A. Mathewsii.*—E Peruvia, (Mathews, No. 932). Affinis *Gymnopetala*, at antheris rectis, filamentorum defectu diversa, hinc nomen.

Sect. III. *Stamina diadelpha, tubo vel fauci inserta. Antheræ* 1—2-*adelphæ, lineares, sursum et deorsum flexæ, secus margines connectivi integri antice vel lateraliter applicitæ. Calyx tubulosus vel infundibuliformis.*

12. *Anguria*, Linn.—Antheræ 2-adelphæ tubo vel fauci sessiles: connectivum apice mucronulatum.

Species plurimas vidi e Peruvia, Mexico, Guiana, &c., at omnes indeterminatas: hic referendæ Mathews, No. 1218, Schomburgk, No. 500.

13. *Psiguria*, Neck?—Filamenta brevia fauci inserta. Antheræ omnes cohærentes; connectivum muticum.

Hujus exemplum in herb. Hookeriano examinavi, quod verosimiliter. *Anguria trifoliata*, L.

SECT. IV. *Filamenta 3-adelpha, summo tubo corollæ inserta, Antheræ omnes connectivis cohærentes et secus connectivi margines dorso applicitæ, sigmoideæ, biloculares.*

14. *Schizostigma.*—Stylus simplex; stigma peltatum, in lobos lineares carnosos 10—12 radiantes fissum.

1. *S. asperata* (*Cucurbita asperata*, Gill.)

SECT. V. *Filamenta distincta vel triadelpha, fauci inserta. Antheræ 5, vel 3-adelphæ, gyrosæ, anticæ.*

15. *Sphenantha*, Schrad.—Flores hermaphroditi. Fructus capsularis, 3-locularis, evalvis. Stylus basi disco haud cinctus, trifidus; stigmata 3, subpeltata.

SECT. VI. *Filamenta 3-adelpha, basi perianthii inserta. Antheræ laterales, rectæ, triadelphæ.*

16. *Pilogyne* Schrad.—Calyx campanulatus. Corollæ laciniæ patentes, calycem multo superantes. Antheræ 1-loculares. Stylus indivisus. Stigma plicatum.

1. *P. Ecklonii* Schrad.? (*Bryonia scabra*, E. M.)

17. *Zehneria*, Endl.*—Corollæ lobi integerrimi. Fructus baccatus, oligospermus.

1. *Z. maysurensis* (*Bryonia maysurena*, Herb. Madr.).—2. *Z. Hookeriana*, W. & A.)—3. *Z. velutina* (*Br. scabra, var.* E. M.—*Pilogyna velutina*, Schrad. ?)

18. *Karivia.*—Calyx urceolato-campanulatus. Corolla vix exserta, lobis minutis integerrimis. Antheræ 2-loculares. Stylus indivisus, basi glandula 5-loba lacerata cinctus. Stigma magnum pileiforme, 3-fidum. Fructus obtusus, vel crasse ac breviter rostratus, subpeponideus.

1. *K. umbellata* (*Bryonia umbellata*, Herb. Madr.)—2. *K. amplexicaulis* (*Br. amplexicaulis*, Lam.)

19. *Rhynchocarpa*, Schrad.—Corollæ lobi denticulato-ciliati. Stylus trifidus. Stigmata 3, inciso-dentata. Fructus tenuiter rostratus.

* Perhaps following Endlicher, this and *Pilogyne* ought to be united; but as the style and stigma differ considerably, they ought at least to form distinct subgenera.

SECT. VII. ***Filamenta triadelpha, basi perianthii inserta. Antheræ omnes cohærentes, posticæ, lineares, rectæ.***

20. *Mukia*.—Perianthium maris fundo glandula instructo. —*Fem.* Stylus basi glandula annulari carnosa cinctus, indivisus. Stigmata 3, plus minusve cohærentia, erecta.

1. *M. scabrella* (*Bryonia scabrella*, Linn.)

SECT. VIII. *Filamenta 5 vel 3 (sc. 5-triadelpha) basi perianthii inserta. Antheræ secus margines connectivi dorso applicatæ, flexuosæ, vel gyrosæ, vel anfractuosæ. Connectivum dentatum vel lobatum.*

21. *Bryonia*, Linn.*—Corolla 5-fida. Antheræ 3-adelphæ, uniloculares. Stylus 3-fidus; stigmata subreniformia vel bifida. Fructus ovoideus vel globosus, baccatus, oligospermus.

1. *B. alba*, L.—2. *B. dioica*, L. (In utraque ovarii loculi 2-ovulati).—3. *B. laciniosa*, L.—4. *B. tenuifolia*, Gill. (hujus antheræ triplicatæ ut in *Citrullo*, at fructus *Bryoniæ*).—5. *B. Garcini*, Willd.—6. ? *B. leiosperma*, W. & A. (In ultima penultimaque speciebus, flores masculos nunc non possideo).

22. *Citrullus* Schrad.—Corolla persistens, 5-partita, subrotata. Antheræ triadelphæ, biloculares? Stylus trifidus. Stigmata obcordata, convexa. Fructus carnosus vel demum sicco-fibrosus, peponideus, polyspermus.

1. *C. vulgaris*, Schr. (*Cucurbita citrullus*, Roxb.)—2. *C. colycinthis*, Schr. (*Colycinthis officinalis*, Schrad.—*Cucumis colocynthis*, L.)

23. *Ecbalium*, Rich.—Corolla 5-fida. Antheræ triadelphæ. Ovula biseriata. Stigmata tria, bicornia. Pepo basi elastice dissiliens.

1. *E. officinarum*, Rich. (*E. purgans*, Schrad.—*Momordica elaterium*, L.)

24. *Echinocystis*,† Torr. & Gray.—Corolla 6-partita, rotato-campanulata. Stamina 3, diadelpha. Antheræ omnes cohærentes, anfractuosæ. Stigmata 2, late obcordata, conni-

* *Boykinia trispora*, Nutt., which I have seen in Sir W. Hooker's herbarium, seems in no respect to differ from *Bryonia*.

† I have only met with this in Sir W. Hooker's herbarium, and the specimens have not the female flowers or fruit.

ventia. Bacca inflata, globosa, setoso-echinata, demum exsucca, 2—4-locularis, 4-sperma, apice? elastice dissiliens.

1. *E. lobata*, T. & G. (*Momordica echinata*, Willd.)

25. *Momordica*, Linn.*—Petala 5, basi calycis adnata, decidua. Antheræ omnes cohærentes. Ovula uniseriata. Stigmata biloba. Pepo capsularis 3-valvis, elastice dissiliens.

1. *M. Balsamina*, L. (*Neurospermum cuspidatum*, Raf.)—2. *M. charantia*, L.—3. *M. dioica*, Roxb.—4. *M. mixta*, Roxb.—5. *M. Garriepensis*, E. M.

26. *Luffa*, Cav.—Corolla 5-petala, basi calycis inserta, decidua. Antheræ nunc distinctæ, nunc 2—3-adelphæ. Stylus 3-fidus. Stigmata reniformia vel bipartita. Pepo demum sicca intusque fibrosa, sæpius operculo terminali dehiscens, rarius indehiscens.

α. Stamina 5-distincta.

1. *L. pentandra*, Roxb.—2. *L. acutangula*, Roxb.—3. *L. Kleinii*, W. & A.

β. Stamina 3-adelpha. (*Huc, ut videntur, species plurimæ* Turiæ *Forsk.*)

4. *L. amara*, Roxb.

γ. Stamina diadelpha ; fructus indehiscens.

5. *L tuberosa*, Roxb.

27. *Benincasa*, Savi.—Corolla 5-partita (flava), patens. Antheræ triadelphæ. Stylus indivisus, brevissimus. Stigma magnum, crassum, irregulariter lobatum plicatumque. Pepo carnosus indehiscens.

1. *B. cerifera*, Sav.

28. *Lagenaria*, Ser.—Corolla 5-petala (alba). Antheræ triadelphæ. Stylus subnullus. Stigmata 3, crassa, 2-loba. Pepo carnosus, indehiscens.

1. *L. vulgaris*, Sav.—2. *L. sphærocarpa*, E. M.

SECT. IX. *Filamenta triadelpha, perianthii tubo inserta. Connectiva integra. Antheræ tri-v.-monadelphæ, posticæ, sursum et deorsum flexæ. Calyx elongatus, tubulosus.*

29. *Trichosanthes*, L.—Corollæ (albæ) laciniæ lacerato-fimbriatæ. Stylus 3-fidus. Stigmata oblongo-subulata.

* I still consider *Mouricia* to be the same genus. Loureiro places it in "*Syngenesia*," from the cohesion of the anthers, although he also asserts these to be "invicem distinctæ." Like Loureiro's other descriptions, that of the present plant is not to be trusted to.

α. Eutrichosanthes;* *flores masculi bractea magna foliacea haud suffulti.*

1. *T. nervifolia,* Linn.—2. *T. anguina,* L.—3. *T. cucumerina,* L.

β. Involucraria; *antheræ omnes cohærentes; flores masc. foliaceo-bracteati.*

4. *T. palmata,* Roxb.

30. *Gymnopetalum.*—Calyx fauci constrictus. Corolla (flava), 5-partita, laciniis integerrimis. Antheræ omnes in conum arcte cohærentes. Fructus baccatus, ovatus, rostratus, oligospermus. Semina teretiuscula, margine obtusa.

1. *G. Ceylonicum;* calyce glabro, foliis 5-lobis (*Bryonia tubiflora,* W. & A.)—2. *G. Wightii;* calyce hirto, foliis angulato 3—5-lobis.

Sect. X. *Filamenta sæpius triadelpha, basi perianthii inserta. Connectiva integra, nisi dum ultra antheras producta. Antheræ lineares posticæ, sursum et deorsum flexæ. Calyx subcampanulatus.*

31. *Cucumis,* Linn.—Corolla 5-partita, integerrima. Antheræ triadelphæ, vel omnes leviter cohærentes, apice appendiculatæ. Pepo carnosus indehiscens vel rarius irregulariter dehiscens, polyspermus. Semina ovata, compressa, margine acuta.

1. *C. melo,* L.—2. *C. momordica,* Roxb.—3. *C. sativa,* L.—4. *C. pubescens,* W.—5. *C. trigonus,* Roxb.—6. *C. arenarius,* Schrad. (*C. prophetarum,* E. M.)—7. *C. Africanus,* Th.—8. *C. rigidus,* E. M.—9. *C. flexuosus,* L.—10. *C. anguria,* L.

32. *Cucurbita,* Linn.—Corolla campanulata, integerrima. Filamenta basi triadelpha, vel omnino monadelpha. Antheræ omnes cohærentes, exappendiculatæ. Pepo carnosus, indehiscens, polyspermus. Semina margine subtumido cincta.

1. *C. maxima,* Duch.—2. *C. succedo.*

33. *Elaterium,* Linn.—Calycis denticuli minuti. Corolla 5-fida, integerrima. Filamenta monadelpha. Antheræ omnes cohærentes. Stylus crassus. Stigma capitatum. Capsula

* Elsewhere I have ascribed to the species of this section triadelphous anthers; but in *T. anguina,* I suspect they are all united; and in *T. cucumerina,* they also, at least in the dried specimen, appear to cohere; in this last, the filaments are inserted almost at the top of the tube of the perianth.

coriacea 1-locularis, 2—3-valvis, elastice dissiliens, oligosperma.

(Huc pertinere videtur, quamvis dioica, *Sicyos angulata*, Hook. Fl. Bor. Am. quod ad exempla ad oras Bor. Am. Occid. lecta; at fructifera non vidi.)

34. *Schizocarpum*, Schl.—Corolla infundibuliformis integerrima. Filamenta triadelpha. Antheræ omnes cohærentes. Pepo in valvas plures apice cohærentes dehiscens, polyspermus.

(Huc etiam forsan trahendum *Elaterium pubescens*, Benth., cujus autem fructus non vidi.)

35. *Coccinia*, W. & A.—Corolla campanulata, laciniis acuminatis integerrimis. Filamenta monadelpha. Antheræ triadelphæ, conniventes, exappendiculatæ. Pepo subbaccatus, trilocularis, irregulariter dehiscens, polyspermus.

1. *C. Indica*, W. & A.

Sect. XI. *Filamenta monadelpha, in columnam apice capitato-antheriferam connata. Antheræ gyrosæ, posticæ.*

36. *Cephalandra*, Schrad.

1. *C. quinqueloba*, Schrad. (*Momordica quinqueloba*, E. M.)

Trib. IV.—Sechineæ, *Schrad.* Flores monoici. Calyx 5-fidus. Stamina 5, connata in cylindrum centralem, superne 5-fidum, divisionibus antheriferis. Antheræ in cujusvis divisionis apice lineam constituentes bis deorsum semelque sursum repentem. Ovarium 1-loculare, 1-ovulatum, ovulo pendulo. Fructus (magnus) carnosus, apice unilocularis, monospermus.—*Schrad.* (præcipue).

37. *Sechium*,* Browne.

Trib. V. Sicyoideæ, *Schrad.* Flores monoici. Calyx 5-dentatus. Stamina 5, in columnam centralem, apice capitato-antheriferam monadelpha. Antheræ apicem columnæ incrassatum omnino tegentes. Ovarium uniloculare, uniovulatum, ovulo pendulo. Fructus (nucamentaceus) unilocularis, mo-

* I have seen no specimen of this genus; Endlicher however, from the similarity of the ovarium, places *Sechium* and *Sicyos* into one tribe, and apparently with justice, as the principal difference lies in the divided or entire staminal column.

nospermus. Semen funiculo filiformi, ex apice descendente suspensum.

38. *Sicyos*, Linn.

1. *S. angulatus*, L.—2. *S. Baderoa*, Bert.—3. *S. vitifolia*, W.—4. *S. pachycarpus*, H. & A.

Trib. VI. CYCLANTHEREÆ, *Schrad.* Flores monoici. Calyx 5-dentatus. Filamenta in columnam integram monadelpha, apice in discum depresso-orbiculatum explanatam: antheræ in annulum marginalem circa discum horizontaliter dispositæ, oblongo-lineares, rectæ. Ovarium uniloculare? tri-(vel pluri)-ovulatum. Fructus spinis mollibus obsitus, "carnosus, unilocularis, oligo-vel-polyspermus. Placenta centralis, deorsum dependens, margine utrinque seminifera. Semina horizontalia." *Schrad.*

39. *Cyclanthera*, Schrad.

1. *C. hystrix* (*Momordica hystrix*, Gill.,) cui fructus obliquus oligospermus, elastice dissiliens.—2. *C. Mathewsii* (Mathews herb. Peruv. n. 736.)—3. *C. digitata* (Math. herb. Peruv. n. 298.)—4. *C. dissecta* (Drummond herb. Texan. II. n. 39. Discanthera dissecta, Torr. and Gray.)—Huc etiam pertinet *C. pedata*, Schrad. (*Elaterium ribifolium*, Schl. in Linnæa, vii. p. 388.)

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## XXI.—BOTANICAL INFORMATION.

### *Notes on Vegetation in Khorasaun.*

THE following interesting remarks on the vegetation about "*Bamean*" have recently been communicated from that place by a highly talented Botanist, in a letter dated August 6, 1840:—

"I have just come to this place from Cabul; but as I was here nearly at the same season last year, I have met with

* Schrader ascribes to this genus subglobose anthers: the whole mass is globose, but each anther is linear-oblong, applied vertically round the capitulum; the cells appear to me to be not straight, but bent again downwards.

but little that is new. The south European vegetation continues, so far as such a statement is assumable by one who never was beyond Paris; but it answers to the definitions of those provinces, not kingdoms, by Schouw, of which I have had a glimpse in Murray's geography. The mountains, if possible, increase in barrenness, and few trees are to be found even among the cultivated tracts, which are always confined to such *rivers* as really contain water. At this place we are on the Tartary side of the Hindookoosh (which is not as has been stated, covered with forests, but absolutely bare of trees) and we are at least 7000 feet above the Tartar plains. There is little difference in the vegetation of either side at these elevations; but that of this side is decidedly poorer in forms and individuals, and has from the saline soil, a greater preponderance of curious succulent *Chenopodiaceæ*, mostly, I assume, referrible to *Kochia*. The only green spots visible are those confined to the banks of the river, and in such places as are not under cultivation, cool green turfy sward occurs, with thickets of *Hippophae*, *Berberis*, *Tamarix*, and *Rosa*. Throughout Khorasaun Eastern, no tropical forms are found even at comparatively low elevations, if we except a few grasses, such as *Holcus*, *&c*., but such if I rightly remember occur on the shores of the Mediterranean. The European nature of the vegetation of the low tracts is almost totally opposed to the received opinions of the effects of temperature; for they are among the hottest climates in the world, and the European forms are not as in northern India, mere annuals confined to the winter months. The Flora of Khorasaun bears on many important points connected with vegetable geography. It shows forcibly the great effect in variety of form, of humidity; it illustrates admirably the similarity of the Flora over a great extent, where no chains of lofty mountains, no seas occur; indeed no obstruction of any sort occurs. The highest ridge crossed *en route* to this, is nearly 13,000 feet; but in consequence of the extreme summer heat, this is not within perhaps 2000 feet of the general inferior limit of snow. At such elevations, the mountains are dotted over

with hemisphærical bushes of prickly *Statices*, and with different sorts of *Thistles*, and *Artemisiæ;* and it is only in damp ravines that any thing approaching to variety is to be found. In such *Euphrasia*, *Primula*, *Juncus*, various *Carices*, *Swertia*, *Gentiana*, *Parnassia*, *Pediculares*, *Ranunculi*, *Silene*, *Astragali*, *&c.*, occur. One is perhaps, on the whole, most struck with the abundance of the prickly *Statices*, and prickly *Astragali*. The grand orders are *Compositæ*, especially *Carduaceæ*, *Leguminosæ*, *Labiatæ*, *Boragineæ*, *Umbelliferæ*, *Cruciferæ*, *Silenaceæ*, *Chenopodiaceæ*, *Gramineæ*. From what I remember of the superb *Flora Græca*, I think that a Bauer could produce one much similar by coming to this country."

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## *Rough Notes on Ceylon Scenery*, by Capt. William Champion; *and Observations on the Banyan Tree*, Ficus Indica.

The following notes on Ceylon scenery and vegetation were made during our friend's very brief stay in that most interesting island, and were communicated along with some very clever sketches, to which the remarks refer, and which we regret it is not in our power also to lay before our readers. The first drawing represents the

Veangodah Lotus Tank.—When Bishop Heber visited Ceylon, *Veangodah* possessed a double Bungalow Rest House. It is now a ruin; but we were able to sketch the *Lotus Tank* mentioned in his journal. The tree to the left is a *Sappan*, with its branches of black pods. Beneath it the *Siritilla*, or *Ipomæa Zeylanica*, is trailing its rose-coloured blossoms. Over the tank waves a bamboo, and the *Nelumbium* in flower is the rose-coloured variety. The Palms are Cocoa and Areca. The tree with horizontal branches is the *Ceiba*, Wolf, or *Bombax pentandrum;* its pods are filled with cotton. Above it rises a Teak (*Tectona grandis*,) with enormous leaves and heads of white flowers several feet long. The Pepper vine occasionally attaches itself to it.

Between Veangodah and Amblessoose.—My intention was to illustrate the journal of an expedition from Columbo

to Matelai, made in August, 1839. This rough sketch is done from memory, and consequently cannot be depended on. We found a valley entirely flooded, which we passed with considerable risk, myself in my Bandy, (Ceylon Buggy) and Mr Hume on horseback. We saw several cattle carried off by the stream, and the inhabitants of the village represented, were seated on the roofs of their huts, the water flowing through the doors and windows.

Otian Kandy.—Probably three thousand feet above the level of the sea, looking down on the district called four Korles. In the foreground is a Ceylon oak-tree (*Schleichera trijuga*), Kohngaha, and a *Bombax heptaphyllum*.

The Kandy Lake, and its beautiful border of Thespesia trees; their thin green foliage dotted with large primrose-coloured hollyhock-like flowers, or turning into yellow sear; screening hills covered with "dell," (brush-wood,) or mounted by trees, bamboos, and cocoa-palms, bewitchingly intermingling their plumage. In sunshine they seem to overhang the waters of the lake; obscured, they retire, darkening to a neutral tint from deep green to purple with green marbling. At sunset, the fleeced clouds frequently become roseate. I have seen the waters of the lake borrow the reflection, rivalling in glaucous hue the famed Andalusian morning-stars, and afterwards becoming a silken blue. In the sultry forenoon, a breath of air ruffles the Bamboo; they bend over like reeds, but so droopingly and so languidly, and recover themselves with such grace, that the effect is charming. One evening at sunset, the waters of the lake became roseate. At night

It is a clime whose veriest decay
Adds fresh luxuriance to the tangled maze
Of jungle parasites. Glittering in the rays
Of the bright orb of night,
The fire-fly's purer light,
Adds brilliance to the lovely flower,
Of the *Thespesia's* foliaged bower.

Storehouse, Matalai.—The two principal trees are a jungle Nutmeg (*Myristica Syria* (?) Moon), and behind it a

Sædumba (*Celtis?*) The large-leaved tree is the Kakuma (*Aleuritis triloba*). A Citron is behind the store-house, and in the right hand corner is the *Acacia hamata*, or Fish-hook thorn, a sensitive creeper of great beauty, which festoons trees all over the interior.

Banyan Tree (*Ficus Benghalensis*).—The sketch of this tree, *Ma Nuga* of the Cingalese, was taken in the Cinnamon Gardens from near the lake in which Sir Robert Arbuthnot's residence, Kew, is situated, and overhangs its waters. A Moosman of the lowest caste is represented in the foreground under a *Paudanus*, or Screw Pine, so common in Arabia as well as on the coast of Ceylon. It is very frequently mentioned by oriental poets under the name of *Cetaca*. Thus in translations of the songs of Jaya-dena,—"a breeze like the breath of love, from the fragrant flowers of Cetaca, kindles every heart, whilst it perfumes the woods with the dust it shakes from the Mellica (*Nyctanthes*) with half-opened buds." Again, "the Cesara (*Crocus*) gleams like the sceptre of the world's monarch, love; and the painted thyrse of the Cetaca resembles the darts by which lovers are wounded." The Cingalese do not follow the example of the Hindu women, who roll up its flowers in their long black hair, after bathing in the Ganges.—At a distance is a Cashew nut-tree, (*Anacardium occidentale*), not unlike an apple tree in its growth, here the commonest of trees, and encouraged as a shade to the Cinnamon, and for the sake of its nuts which are collected in April, by women furnished with long poles. —Among the Cocoa-trees in the distance, is the Kitul, or Jagghery Palms, *Caryota urens*, easily distinguished at a nearer approach.

Banyans are the favourite resort of the rose-winged parroquets (*Palæouris torquatus*), Jamboo pigeons, and others of the feathered race; and in thick jungles they are the abode of numerous parasitical plants, the most common of which is the *Pothos scandens*, and the most beautiful the *Cycas circinalis* (Madu Gaha). The green sward which encircles the Lalu (turquoise set in emerald), is enlivened by the rose-

coloured flowers of the Madagascar periwinkle, the specious blue of the *Exacum Zeylanicum*, Roxb., and by the delicate *Burmannia disticha*. Early in the morning, the Paddy-Bird, or white Egret, raises its plaintive cry, or is seen floating over the lake, while the *Passiflora fœtida*, bespangled with dew, stars the dim grove with its moss-sheathed and snow-white petals. The marshy margins encourage the growth of the weeping-bamboo, of the lotus-lily, and Sumatran Cassia (*Cassia Sumatrana*), the latter in flower forming a golden expanse, seen afar off, and the haunt of ultramarine king-fishers; and the waters themselves are often bordered by the azure-spiked Balnahuta (Dog's tail), *Stachytarpheta Indica*, which for some miles around Herat Goddah form a natural carpeting. We also find an insignificant Larkspur. The most common brush-wood at this part of the lake consists of Idda Gar (a plant with white flowers and pods like French willows), *Carissa spinarum*, Osbeckias, *Crotalaria retusa*, and *laburnifolia;* Cassias, and the blue, scarlet, and white flowers of the *Samara læta*,* the *Ixora coccinea*, and the *Pavetta Indica*, together with the wax-berried *Ehretia aspera*, and the *Catesbæa spinosa*, or yellow-flower lily-thorn. Many of these shrubs mingle their foliage with the Kahaga-mula-nati-wala (*Cuscuta reflexa*), and the scarlet and black-seeded *Abrus precatorius*, called Olinda. We have also the *Ulmus integrifolia;* but the most common trees here are the bread-fruit, wild bread-fruit, and jack, the Java almond and cinnamon, the *Dillenia aquatica*, not unlike an alder, and *Tabernæmontana dichotoma*, or forbidden fruit, the *Averrhoa Bilimbi*, and Cashew. There is likewise the handsome *Morinda citrifolia*, and *Calophyllum inophyllum*, the lofty Coral and the Pippal tree. The same vegetation extends over the Cinnamon-gardens to the belt of Cocoa-nuts which overhang the sea, and nearer which grow in profusion the beautiful *Mertensia dichotoma*, and the *Lycopodium cernuum*, used as a shelter for the young cinnamon. In marshy ground occurs the Pitcher Plant,

* A species of *Memecylon* is probably here meant.—Ed.

and in sand under sheds, the sweet perfumed *Pancratium Zeylanicum*, the showy *Gloriosa superba*, and *Hibiscus Surattensis*, whilst *Hibiscus sp., Vitex trifolia, Memecylon ramiflorum, Eugenia Zeylanica, and Elæocarpus serratus*, are common trees. I know not of any more beautiful than the last when in blossom from its bird-cherry-like cluster of profuse and fringed flowers, and its leaves in sear turning to a brilliant scarlet. *Lantana aculeata*, or an allied species, is likewise common near the lake.

The above sketch of the *Ma Nuga*, or Banyan tree, is not one which Strutt would have chosen. I mean to say, that so far from the specimen being that of a Banyan remarkable for size or beauty, it is (although an old tree), rather under the usual proportions; but it was the only specimen on which, at that time, I could conveniently exercise my pencil.

At Matalai in the interior of Ceylon I saw a very interesting specimen of the same species, which had just arrived at maturity, and was said to be about fifty years old. Its branches were of great length, extending on all sides to about forty feet from the stem, with a few rooting shoots dropping from them to the ground, all of which were carefully protected by the natives. If its age has been correctly reported, it would appear that this Banyan may remain a long time without requiring the support for which its species is so celebrated. But when the growth of the branches becomes too great and too heavy for the stem, the first care of nature is to fortify the latter, before she resorts to the archway system. Such, at least, was beautifully exemplified in this tree, which had (apparently not long previously) thrown out from the lower branches an enormous fringe of radiating shoots, encircling the whole stem, of equal length; and when I saw the tree, hanging to within a few feet of the ground. This fringe was several feet broad; and in rain, could have afforded perfect shelter underneath, supposing there had been no foliage to the branches. The twigs of the Banyan when broken, yield a clammy white milk. The nuts (or figs) are in pairs and of an orange red colour, except the base which is

Major Forbes del. W. Fitch lith.

NUGA GAHA, a remarkable Banyan Tree. (FICUS INDICA)

green with red spots. It is probable that Major Forbes may have a drawing of this very tree.

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## *Further Notes on the* BANYAN.

(TAB. XIII. XIV.)

Captain Champion lost no time in writing to Major Forbes, asking him for a copy, if he had such a drawing, for me. "He has kindly sent me one," writes Captain Champion in his recent letter to me, "with the following account, which is so graphic, that I transcribe it verbatim." (See TAB. XIII.)

"We were inspected on Saturday," says Major Forbes, "so after that was over, I looked through my box of sketches, and was glad to find one of the *Nuga tree* you mention, viz., at Marakona on the road to Kandy from Matalai. I believe it is correct, as the tree then was. At that time (now ten years ago), none of the shoots were allowed to reach the ground, being always nipped off by the nails of an old woman who regularly swept all round the tree every day. This was no point of religion in the old *wify*, but merely an occupation by which she got a few *pice* from travellers who rested under its shade. In this sketch, Dombura peak is seen beyond the lowest branch. The clammy white juice, has, I believe, all the properties of India rubber.* The *Nuga* is not held sacred by the Boodhists, although the Brahmins respect it. All the Buddhas choose different Bo trees, and the *Ficus religiosa* is that which Gantama (the Buddha now worshipped,) selected, and it is therefore now called *the* "Bo-gaha," *par excellence*. It was under one of that species he reclined and meditated during his sojourn in the wilderness, and he had *his call*.—The ancient city of Amuradhapoona, in Ceylon, owed much of its celebrity to the Bo-tree, still existing there, and brought from the continent B.C. 307. It was a branch of the one under which Gantama reclined when he became a Buddha. All

* As is the case with the juice of all of the Genus *Ficus*. The East Indian *F. elastica*, now so common in our greenhouses and stores, is the species that yields a great deal of Caoutchouc of commerce.—ED.

the sacred Bo-trees in Ceylon are shoots or seeds of that tree, or are reputed to be so, and are generally built round to protect them from animals.

"Under the shade of the Nuga tree at Marahona, numbers of an insect that showed a bright light at night were always crawling about; they have a scaly back, were an inch or an inch and a half long, and one-fourth of an inch broad. (Probably a female glow-worm, as one was brought to me at Matalai, answering exactly to Major Forbes' description. *W. Champion.*) In *Cordiner's Ceylon*, 2 vols. 4to, published about 1804, there is an engraving of a very famous Banyan which grows somewhere on the continent of India."

The above remarks of Major Forbes, as well as of Captain Champion, are extremely interesting, discriminating at once, as they do clearly, between the Banyan* tree (*Ficus Indica*,) so remarkable and so peculiar for its vast rooting branches, and the Pippal, Peppul, or Sacred Fig of India (*Ficus religiosa*,) readily known from the Banyan by its rootless branches, and its heart-shaped leaves, with exceedingly long attenuated points; upon which leaves, the parenchyma being removed, and the skeleton varnished, most beautiful drawings of birds, insects, and flowers, are made by the Chinese, and commonly sold to Europeans. Now, these two celebrated Figs are continually misunderstood by unscientific travellers; and, which is worse, Botanists seem to be very ill acquainted with them; and in the two most popular and scientific works of reference in this country (we allude to Lindley's *Introduction to the Natural System of Plants*, and Loudon's *Encyclopædia of Botany*, where it is called *F. religiosa*,) the Banyan tree is wrongly named. Our friend Captain Champion too has been slightly misled, in the name given in his letter and upon his drawing, by the Botanist Moon, who, in his Cinghalese Catalogue, calls the Banyan tree of Ceylon *Ficus Benghalensis*, while his (Moon's) reference to Rheede,

* Another source of error among unscientific inquirers arises from the similarity of the name *Banyan*, with that of another well-known eastern plant, the *Banana* or *Plantain*.

Ficus Indica

*Hort. Malabar*, vol. i. t. 28, proves it to be *Ficus Indica*, Linn., and certainly of Roxburgh, whose clear account of the plant, and his great knowledge of Indian Botany, render him the highest authority in such a case. Our Herbaria, too, I suspected to be miserably defective in specimens of the true Banyan, which every body speaks of, but which few have discriminated. Our own Herbarium, rich as it is in the productions of our eastern possessions, does not yet possess a single specimen; and Dr. Arnott, among the vast collections which he has received from Dr. Wight, has only one indifferent specimen, which he has allowed us to examine; but our figure (Tab. XIV.) is a faithful copy from No. 682 of Dr Roxburgh's drawings in the East Indian Company's Museum. Our readers, also, will not be displeased to see Roxburgh's description; and Dr. Arnott has assisted us in elaborating the synonyms, so that we trust, henceforth, all ambiguity respecting the scientific name of the Banyan will be removed, and that our figure will render the species intelligible to all who may feel interested in this tree. With regard to the Linnæan *Ficus Indica*, it would appear from his character of the leaves, and his reference to Rheede, vol. 3. t. 63, (Roxburgh's *F. Tsiela*) that he drew up his account partly from the popular history of the true Banyan, and partly from Rheede's figure above quoted. When, however, we consider that he says of his plant, "ramis radicantibus," and that Roxburgh observes, that "he knows of no other species of *Ficus* which sends forth fibres from the branches that descend to the ground and *become trunks*," we are disposed to agree with Sir James Smith, in believing he had the Banyan in view when he described his *F. Indica*. No more can we doubt that Southey has the same tree in view, when, in the Curse of Kehama he says—

> "It was a goodly sight to see
> That venerable tree,
> For o'er the lawn irregularly spread,
> Fifty straight columns propt its lofty head;
> And many a long depending shoot,
> Seeking to strike its root,
> Straight like a plummet, grew towards the ground.

Some on the lower boughs, which cross'd their way,
Fixing their bearded fibres round and round,
With many a ring and wild contortion wound,
Some to the passing wind at times, with sway
Of gentle motion swung.
Others of younger growth, unmoved, were hung
Like stone-drops from the cavern's fretted height.
Beneath was smooth and fair to sight,
Nor weeds nor briars deform'd the natural floor,
And through the leafy cope which bower'd it o'er,
Came gleams of chequered light.
So like a temple did it seem, that there
A pious heart's first impulse would be prayer."

In the *Madras Journal of Science*, Colonel Sykes speaks of a Banyan tree at the village of Mhow, in the Poona collectorate, with sixty-eight stems descending from the branches, and capable of affording shade, with a vertical sun, to 20,000 men.

The name *Ficus Benghalensis* was taken up by Linnæus from Commelyn, 1. t. 62, and he has been followed by Willdenow; but most authors seem now agreed that by this is equally intended the Banyan, *F. Indica*. Commelyn, unfortunately, added to the confusion, by quoting as a synonym the Hindoo name "Pippal," which is certainly a totally different species; and, as we have before observed, the *F. religiosa*. Of this we shall probably take an opportunity of giving a figure in our Journal.

*Ficus Indica*; branches dropping roots which become as long as the original trunk; leaves ovate-cordate; fruit in sessile axillary pairs. (TAB. XIV.) Roxb. *Fl. Ind.* 3. *p.* 539.

Ficus Indica, Linn. *Amœn. Acad.* 1. *p.* 27. Smith in Rees' Cycl.—*Ham. in Linn. Trans. vol.* 13. *p.* 489. (non Willd., nec Moon, nec Spreng.*)

Ficus Benghalensis, *Commelyn. Hort.* 1. 62.—Linn.—*Willd. Sp. Pl.* 4. 1135. *Moon. Ceyl. Fl. p.* 71. *Spreng. Syst. Veget.* 3. *p.* 780. *Thunb. Fl. Jab. p.* 817.†

Vuta. *Asiatic Res.* 4. *p.* 310.

* Which is *Ficus Tsiela*. Roxb.

† *F. Benghalensis* of Roxburgh's drawings, No. 687, is, according to Dr Arnott, *F. tomentosa* of his Flora Indica.

Peralu. *Rheede Hort. Malab.* 1. *t.* 28.

Varinga *latifolia. Rumph. Amb.* 3. *t.* 84. (fig. bad.) *Pluk. Phyt. t.* 178. *f.* 1.

Native names. Bengh. *Bur,* or *But.* Sanscr. *Vuta.* Cingh. *Bagha* and *Ma-nuga.* Brahm. *Vallhoe.* Teling. *Marie.*

"An account of this immense and most beautiful tree is to be met with in almost every history of India.

"It grows wild about the skirts of the Circar mountains, but in greatest perfection about and in villages where it is planted for the sake of its extensively cool, grateful shade; it is there the tree is found in its greatest perfection and beauty. Flowering time the hot season. I know of no other species of *Ficus,* which sends forth fibres from the branches that descend to the ground, and become trunks.

"Trunk; when young it is distinct, and single; at all times its form, thickness and height, very variable; still more so than that of *F. religiosa,* because generally reared from branches procured naked, and stuck in the ground. Branches spreading to a great extent, dropping capillary roots here and there; these enter the ground as soon as they reach it, gradually becoming as large as, and similar to, the parent trunk, by which means the extent becomes almost incredible; the height of the tree is at the same time slowly increasing: some I have seen fully five hundred yards in circumference round the extremities of the branches, and about one hundred feet high, the principal trunks of which might be more than twenty-five feet to the branches, and eight or nine in diameter: they are largest about the villages situated in fertile valleys among the mountains. The bark is smooth and of a light ash-colour. The wood light, white and porous. Leaves alternate, about the extremities of the branchlets, petioled, ovate-cordate, three-nerved, entire; sometimes the border is very slightly waved; when young very downy on both sides; when old, less so, particularly above; from five to six inches long, and from three to four broad, at the apex of the petiole: on the under side, is a broad, smooth, greasy-looking gland. Petioles a little compressed, from one to two inches long: downy. Sti-

pules within the leaves, sheathing, downy, falling, leaving their annular marks on the branchlets. Fruit paired, axillary, sessile; when ripe, the size and colour of a middle-sized red cherry: downy. Calyx of the fruit three-nerved.

"Note.—Fig. 1. of Plukenet's 178th table is a much better figure of this tree than fig. 4. of the same table.

"The Bramins are partial to the leaves of this tree to make their plates to eat off; they are jointed together by inkles.

"Bird-lime is prepared from the tenacious milky juice, which every part of the tree yields on being wounded.

"Birds eat the fruit, and the seeds grow the better for having passed through them; if they drop in the alæ of the leaves of the Palmyra tree, (*Borassus flabelliformis,*) they grow and extend their descending parts so as in time to embrace entirely the parent Palmyra, except its upper parts. In very old ones, the top thereof is just seen issuing from the trunk of the Banyan as if it grew from thence, whereas it runs down through its centre, and has its root in the ground, the Palm being the oldest. For such the Hindoos entertain a religious veneration; saying it is a holy marriage instituted by Providence."—*Roxburgh.*

TAB. XIII. Sketch of a remarkable Banyan tree in the island of Ceylon, from a drawing by Major Forbes.

TAB. XIV. Portion of a branch of the Banyan tree (*Ficus Indica,*) from Dr Roxburgh's collection of drawings. Fig. 1. portion of a branch, showing the fruit growing in pairs; f. 2. fruit, *nat. size.*

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FLORA OF NORTH AMERICA; *containing abridged descriptions of all the known Indigenous and Naturalized Plants north of Mexico, arranged according to the Natural System.* By Drs JOHN TORREY and ASA GRAY. Vol. I. Parts III. and IV.

THE first two parts of this invaluable work we have already noticed, in an early number of our *Journal of Botany*, and much as we have commended them, the continuation is

worthy of still higher praise, inasmuch as it has been published under more favourable circumstances; one of the authors (Dr Gray) having since the appearance of the first two portions, made a very extensive tour in Europe, for the purpose of examining the various herbaria which can throw light on the species already published by different authors; and we can bear ample testimony to the great energy, untired patience, and distinguished talent which the authors have employed (both Dr Torrey and Dr Gray, each in his respective visit) in unravelling confused synonyms, and in clearing up doubtful species. Thus, as shown in the preface, besides the numerous authentic specimens largely contributed by travellers and botanists from all quarters, these able naturalists have carefully examined the treasures in the herbaria which formed the ground-work of Hooker's *Flora Boreali-Americana*, and Hooker and Arnott's *Botany of Captain Beechey's Voyages*, and the fine collections made by Mr Drummond in Texas. Under the auspices of Mr Brown, the Banksian Herbarium, and the Herbaria of Clayton, Catesby, Plukenet, &c., were thrown open to them; as were also the very complete collections of the late Mr Douglas, deposited in the Horticultural Society's Museum, and that of Mr Bentham and Dr Lindley. The Linnæan Herbarium was examined; that of Pursh, of Bradbury, and of Nuttall, in Mr Lambert's possession; and that of Walter, the property of Mr Fraser. In France, the plants of Lamarck and Poiret were identified in the collections of Prof. Adrien de Jussieu, and of his distinguished father; those of Michaux, in the Museum of the *Jardin des Plantes.* The readiest access was granted to the rich and varied stores in the Baron Benjamin Delessert's immense Herbarium, and to those of P. B. Webb, Esq., which includes the Herbarium and numerous American plants of Desfontaines, while Mr Spach supplied specimens of dubious or interesting American plants which had long been cultivated in the Botanic Gardens of Paris. Dr Gray has carefully gone through all the families that were published in the *Prodr. Syst. Veget.*, as far as they

bore on North American Botany, in the large and important Herbarium of Professor De Candolle of Geneva. Germany was visited: the Herbarium of Willdenow, and the other rich collections of the Royal Berlin Herbarium, under the auspices of the zealous curator, Dr Klotzsch; the Imperial Herbarium of Vienna, in charge of Dr Endlicher and Dr Fenzl; the Royal collections and Garden of Munich, through the liberality of Dr Von Martius, and Professor Zuccarini; Schlechtendal's at Halle, possessing as it does so many plants which that author and Chamisso had described from California, and N. W. America, and the *Carices* and entire Herbarium of Dr Schkuhr; the plants of Mexico and New Spain, collected by Humboldt and Bonpland, in possession of Professor Kunth; those of Dr Lehmann of Hamburgh, so rich in Greenland plants, and in the genera *Potentilla, Œnothera,* and family of *Boragineæ;* and lastly, those of the Imperial Academy of Sciences at St Petersburgh, where Dr Trinius and the late M. Bongard laid open to him the various collections that had been received from Russian North America. These most useful investigations, not accomplished till after the appearance of the first two parts of the *Flora,* have induced the necessity of making several changes and corrections, which are done with great candour and judgment in an *Appendix* or supplement at the end of the volume. "This," they justly observe, "will give the work an important value in respect to authenticity of the specific names, so that future changes of the kind will not be to any considerable extent necessary."

Nor can we look at the list of American Institutions and Naturalists named in the preface, which have contributed to this great undertaking, without being satisfied that Botany is making rapid strides in the United States; that a *Flora,* like that under review, is imperatively called for; and that *it* must and will be a powerful means towards making the entire vegetation of this vast continent thoroughly known to the scientific world. We are anxious that the names of these individuals who have so ably promoted the cause of

American Botany, should be recorded in the pages of our Journal. At the head of them, justly stands Mr Nuttall, to whom the authors are indebted (independently of the immense mass of information derived from his valuable publications, which are known wherever Botany is studied), for a nearly complete series of the plants collected during his recent journey across the Rocky Mountains to Oregon and California, accompanied with manuscript descriptions of his new genera and species, and also for many plants obtained during his travels in Arkansas in the year 1819. The Academy of Natural Sciences at Philadelphia, afforded the opportunity of examining the chief collections of Mr Nuttall, those of Mr Von Schweinitz of Mechlenberg, and Professor Benjamin Smith Barton. The daughter of the lamented Elliott sent whatever was needful for examination of her father's Herbarium; and Dr Bachman, and Professor Gibbes of Charleston, South Carolina, supplied many plants of that fertile territory. Professor Bigelow, B. D. Greene, Esq., Mr E. Tuckerman, Mr Oakes, Dr Jacob Porter, Mr T. A. Greene; Professors Hitchcock, Emmons, and Dewey, sent the productions of Massachusetts, of Maine, and New Hampshire; Dr Barratt of Middleton, Connecticut, distinguished by his knowledge of North American *Willows*, communicated specimens from that neighbourhood, and from the White Mountains of New Hampshire, and Professor Tully from the vicinity of Yale College. Plants of the state of New York, most of which must have been already familiar to the authors themselves, have further been supplied by Dr Stevenson, Dr Bradley, Dr H. P. Sartwell, Mr David Thomas, Dr Crawe, Dr Aikin, Professor Lewis, C. Beck, Mr A. J. Downing, Professor Bailey, Mr William Cooper, Mr Halsey, Professor Eaton, Mr R. J. Brown, and Mr John Carey. Of the plants of Pennsylvania and New Jersey, the chief contributors have been Dr Pickering, Mr Durand, and Dr Darlington. Of those of Virginia, the Rev. Professor Ruffner. For plants of North Carolina, they are chiefly obliged to the Rev. Mr M. O. Curtis, the late Mr Von Schweinitz, and to

the late Mr Croome, who also made very interesting collections in Florida. From South Carolina and Georgia, the late Mr Elliott, Major Le Conte, and the late Mr Lewis Le Conte, Professor Gibbs, Dr Boykin, Dr H. Loomis, and Dr Bacon supplied valuable materials; while from Middle Florida, Dr A. W. Chapman, and Dr Alexander; from southern and eastern Florida, Dr Leavenworth, Dr Burrows, Dr Hulse, Lieutenant Alden, and Dr John F. Baltzell from Apalachicola, have sent very important communications. The vegetation of Alabama has been made known by Dr Gates, Dr Fletcher, and Dr Jervett.

From Louisiana, the chief collections from the United States' botanists have been from Dr Ingalls, Dr Riddell, Dr Hall, and Professor Carpenter; from that state and from Arkansas, and the borders of Texas, through Dr Leavenworth and Dr Pitcher. From Tennessee, Dr Currey has sent interesting plants; from Kentucky, Professor Short, Dr Peter, the late Mr H. K. Eaton, and Mr Rafinesque. From Illinois, (as also from Virginia and Alabama), Mr Berkeley has communicated many plants; Dr Clapp from Indiana; Mr T. G. Lea, Mr Sullivant, Mr Samples, and Dr Paddock from Ohio; while the vegetable productions of Michigan, and from near the sources of the Mississippi, have been received from Dr Houghton, Dr Wright, Major B. D. Douglas, Dr Pitcher, and Dr Letham. To Dr Holmes, Mrs Percival, Mr and Mrs Sheppard, and Mr M'Crae, they are indebted for numerous plants of Canada; and, lastly, they mention Dr Edwin James as the source from whence so many of the plants of the Rocky Mountains have been derived.

It is now time for us to notice something of the contents of the two Parts (III. and IV.) of the *Flora* in question. The 3d part commences with the continuation of the *Leguminosæ*, and with the greater portion of the Genus *Desmodium*, which here extends to twenty-one species. *Lespedeza* has six species, and we have the interesting remark, that the fruit of the first section, *Eulespedeza*, is chiefly produced by the apetalous flowers, which are small, and commonly escape

notice till the legumes are formed. Authors have sometimes described the calyx from apetalous flowers, which has caused some discrepancies. *Lupinus*, being mainly a genus of Western America, most of the species (forty-five in number) have been detected by Douglas. There are fourteen species of *Baptisia. Virgilia lutea*, here constitutes the genus *Cladrastus* of Rafinesque. Of the genus *Hoffmanseggia*, two species are now known to inhabit North America, *H. Drummondii*, from Texas, and *H. Jamesii*, from the sources of the Canadian River. *Cæsalpinia pulcherrima*, and *Guilandina Bonduc*, are denizens of the southern extremity of Florida. *Algarobia* too, a genus of South America (a section of *Prosopis* in De Candolle), (and the species *Prosopis glandulosa* of Torrey) has been found by Dr James at the Canadian River, and by Drummond in Texas. The remainder of the *Mimoseæ* are few in number in point of species.

The *Rosaceæ* occupy a considerable portion of the pages of Part III. *Chrysobalanus Icaco*, or Cocoa Plum, (together with several other tropical plants,) seems to have attained its northern limits in South Florida. *Spiræa* extends to thirteen species, exclusive of *Gillenia*. *Geum* and *Sieversia* of Brown are united, and *Stylopus* (Rafinesque) is also received into *Geum*, and the number of species is fourteen. *Dalibarda lobata*, (*Baldw. and Hook. Ic. pl. t.* 76,) is united to *Waldsteinia*, and we have the remark that *Comaropsis*, DC., is not distinct from it. Of the curious and rare Genus *Cercocarpus*, there are three new species of Nuttall, all of them figured in *Hook. Ic. plant*, (tabs. 323, 324, 325.) *Horkelia* (of Cham. et Schlecht.) has six species, *Potentilla* 38, (exclusive of *Comarum*.) The genus *Rubus*, (23 species,) is worked up with great care. The *Roses* (here amounting to 15,) scarcely seem to possess more tangible characters than those of Europe. The North American species of *Cratægus*, (17,) seem to us to be here for the first time clearly defined. *Peraphyllum* is a new genus of Nuttall, allied to *Amelanchier*, forming a low much-branching shrub in the Blue mountains of the Columbia.

Among *Lythraceæ*, *Hypobrichia* (M. O. Curtis, mst., 1836,) is the same with *Ptilina aquatica*, Nutt. mst., (1838.)—*Rhizophora Mangle*, the Mangrove-tree, is found in swamps in Louisiana and Florida; and *Terminalia Catappa* in South Florida.

The genus *Epilobium* extends to 14 species, and *Œnothera* to no less than 62. *Gaura* to 9; *Stenosiphon* (Spach.) being separated from it. *Ludwigia* has 15. *Myriophyllum* receives *Hylas* of Bigelow (*Ptilophyllum*, Nutt.) and thus reckons 7 species. *Bartonia* is united with *Mentzelia;* so is *Trachyphyllum* (Nutt.), and *Acrolasia* (Presl.); and thus there are 12 species. *Cevallia* of Lagasca, (*Petalanthera* Nutt.,) is here first reduced to its proper natural order, viz. *Loasaceæ*.

*Echinocystis* (Torr. and Gr.) is a new genus, destined to receive the *Sicyos lobata*, Mx.

*Ribes*, which begins the last (or 4th part) of vol. i. musters 28 species. The *Cacteæ* are 2 *Mammillariæ*, 1 *Echinocactus*, 1 *Cereus*? and 5 *Opuntiæ*. The Order *Saxifragaceæ*, with its suborders, *Escallonieæ*, *Hydrangeæ*, and *Philadelpheæ*, is a more interesting one; and besides extending the North American species of the genus *Saxifraga* to the number of 46, we have the new genus of *Boykinia*, Nutt., and its 2 species, the one from North Carolina, the other from the Columbia. *Heuchera* has 15 species; the *H. Menziesii* is made *Tolmiea* of Torrey and Gray, (not Hook. which is *Cladothamnus*, Bongard.) *Tellima parviflora*, Hook., and *T. heterophylla*, H. and A.; and 3 new species constitute the genus *Lithophragma*, Nutt., all natives of North-west America. *Jamesia* is a new genus of *Hydrangeæ* from the Platte, or the Canadian river, near the Rocky mountains, gathered only by Dr James.

The *Umbelliferæ* include several genera previously undescribed. *Edosmia*, Nutt., is substituted for *Atænia*, Hook. et Arn.; it being shown that these authors overlooked the *vittæ* in the fruit, from the absence of which they derive their specific name. *Neurophyllum longifolium* is an entirely new

genus from Middle Florida and North Carolina, and is allied in appearance to *Archemora ternata*. *Euryptera lucida*, Nutt. mst., is from California. *Eurytænia Texana* is a Drummondian plant from Texas. *Glycosma occidentalis* is another new genus of Nuttall, from the Columbia, as is *Cynapium apiifolium*. *Deweyia*, Torr. and Gray, is the *Ligusticum argutum*, Nutt. mst. The *Seseli divaricatum*, Presl. and Hook., and three new species, all from the Rocky mountains, form the Genus *Musenium*, Nutt. mst. *Leptocaulis inermis*, Hook. et Arn., and an allied species, constitute Nuttall's new genus *Apiastrum*.

Under *Cornus* are some admirable remarks, tending to elucidate the species which have been hitherto much confused. No *Loranthus* has yet been found in North America, or rather none north of Mexico; and of the Order there are only two species of *Viscum* (*V. flavescens*, Pursh., and a new species *V. villosum*, Nutt.) and *Arceuthobium Oxycedri*. This family concludes the 4th or last part of the first volume extending to 655 pages, and comprising the polypetalous division of the Dicotyledonous or Exogenous Plants.

The supplement, as we have already observed, contains some very important additions and emendations. *Enemion*, Rafinesque, is restored to *Isopyrum*. *Croomia* is a very curious genus of *Menispermeæ*, growing in Middle Florida under the shades of *Torreya taxifolia*, Arn., with the habit of a *Monocotyledonous*, some *Smilacineous* or *Dioscoreaceous* plant; it is figured by Torrey in *Ann. Lyc. N. York*. 4. *t*. 7.—*Castela* is a genus added to the North American Flora by Drummond, who found the same species in Texas, (*C. Nicholsoni*, Hook. Bot. Misc. I. t. 55.) which had been discovered in Antigua. *Pavonia* and *Melochia* are two tropical genera, detected among Drummond's Texas plants. *Discanthera* is a new genus* of *Cucurbitaceæ*, derived from the same source.

We shall hail with peculiar pleasure the appearance of the second volume of this great undertaking.

* United by Dr. Arnott to *Cyclanthera* : vide p. 288 of this Journal.

*A Catalogue of the* PLANTS *growing in* BOMBAY AND ITS VICINITY, *spontaneous, cultivated, or introduced, as far as they have been ascertained. By* JOHN GRAHAM, Bombay, 1839.

BESIDES the late John Graham, Esq., Deputy Post-master-General of the Bombay Presidency, whose name stands as the Author of this Catalogue, Joseph Nimmo, Esq. of Bombay, has been long known as deeply interested in the Botany of Western India, and with both of them we have enjoyed correspondence. The Mst. of this work in question was presented to the Agricultural and Horticultural Society of Bombay in 1838, accompanied by the following letter, addressed to James Little, Esq., Secretary to the Society:—

SIR,—I beg to present to our Society a List of the Vegetable productions of the Bombay Presidency, and to signify my willingness to see it correctly through the press, should the Society deem it worthy of publication. It has been drawn up with great care, through the assistance of Mr Nimmo, and not a single plant is put down which has not been seen and examined by one or other of us. I need hardly say, that such a List is much wanted by all who pay any attention to the study of Botany, and will save much time and trouble in consulting books and figures.—I am, &c.

JOHN GRAHAM,
*Member of the Agric. and Hortic. Society.*

The Committee of the Society promptly and liberally accepted the offer, and the printing of the Catalogue had proceeded under Mr Graham's superintendence, as far as the 200th page, when death terminated his labours. The remainder has been completed, the preface tells us, under the superintendence of Mr Nimmo, who has been for many years a zealous and successful labourer in the same field of service, and who has given the gratifying assurance that he will continue to dedicate his time to the investigation of this hitherto neglected part of India, much of which still remains unexplored, and that he will print supplements to their Catalogue

from time to time, as additional species and additional information present themselves. Various have been the assistance and contributions received from different sources towards promoting the interests of this volume, but acknowledgments are more especially expressed to Mr Law of the Civil Service, together with Drs Lush, Gibson, Murray, and Headle of the Medical establishment, with all of whom the Author was in constant correspondence, and from whom he received very important aid. With regard to Mr Graham himself, we learn that he was a native of Dumfries-shire, and that he arrived in India in 1828, under the patronage of the late Sir John Malcolm, who was at that time Governor of the Bombay Presidency, and that he was honoured with his friendship and esteem, and resided in his family until he was nominated by him Deputy Post-master-General, an appointment he held till the period of his death. He possessed a combination of qualities which peculiarly fitted him for that office. The performance of his arduous duties, indeed, left him little leisure for the prosecution of his favourite pursuit; but the few and brief opportunities, which were afforded him, were eagerly seized and improved; and one of the objects he had most at heart while superintendent of the Society's Garden, shortly after its establishment, was to store it with an extensive assortment of rare, wild, as well as useful Indian plants, chiefly collected by himself. He expired at Khandalla, the favourite scene of his botanical researches, on the 28th of May, 1839, at the age of 34, after only a few days' illness. The intelligence of his decease was received at every station within the Presidency, with an almost universal feeling of sorrow and regret, and his friends have testified their admiration of his character, and their grief for his death, by the erection of a handsome monument over his grave.

To Mr Nimmo, this country, Britain, and the Glasgow Botanic Garden in particular, is indebted for the introduction of several rare and beautiful Indian plants: amongst them the singular *Impatiens scapiflora* (W. and A.), in the *Botanical Magazine*, tab. 3587, the splendid *Habenaria gigantea*,

(Bot. Mag. t. 3374.) the *Habenaria goodyeroides*, (Bot. Mag. t. 3397.) and many others.

The arrangement of the work under notice is that of De Candolle's *Prodromus*, and the number of species, including *Ferns*, is 1799, exclusive however of several new plants mentioned in the supplements, and some new genera. The book is much more than a catalogue; there are tolerably copious synonyms, references to figures, remarks on the uses, properties, &c., and frequent poetical and classical allusions and characters of the new species. That such a publication in the presidency itself will tend materially to promote the study of the Botany of the Western side of India, we cannot for a moment doubt; nor that this stimulus will induce many who have the inclination and the opportunity to explore the great chain of the Ghauts, (which could not fail to yield an abundant harvest,) and much interesting country to the north of Bombay, particularly Guzerat, Cutch, and the great sandy deserts bordering on the Sindy and on Moultan.

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### Drummond's *American Mosses*.

It gives us pleasure to announce that several copies of the *Specimens of Mosses of North America*, those of the more northern or British possessions, and those of the extreme southern of the United States, collected by the late Mr Thomas Drummond, are in a state of very great forwardness, and will soon be ready for publication. The selection of suitable specimens, and the arrangement of them, and the determination of the species, have been mainly undertaken by one of the most distinguished Muscologists in Britain, whose discriminating eye, unexampled neatness in all manual labour, and indefatigable research, are beyond all praise. Under such auspices, the editor of this Journal is sure that he can recommend their fasciculi to all who are interested in the study of Mosses, as peculiarly worthy of their attention. Further particulars will be given as soon as the sets are fully completed. In the mean time, it may be sufficient to say, that orders for sets may be

given to William Wilson, Esq., Breech Cottage, Warrington, to Mr Pamplin, Jun., 9, Queen Street, Soho, London, or to the editor of this Journal, Glasgow.

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### *Notice of the* WURTEMBURG UNIO ITINERARIA.

THE first part of Wilhelm Schimper's Botanical Treasures from Abyssinia, viz., the plants collected in the neighbourhood of Adoa, "Plantæ Adensis; sectio prima," will herewith reach the hands of the several subscribers; and we feel assured that these plants will be received by them with perfect satisfaction;—even should the further collections of this traveller be lost, which, however, we have no reason to fear.

Although a considerable part of the first consignment had suffered much from the attack of insects and of damp, both in Abyssinia, and on the way thence, so that of several species, the whole number of specimens was rendered useless, yet the greatest part arrived in good condition, as those now received will abundantly testify.

The tickets which accompany the plants give the exact localities of all the species with their determinations; these latter have been worked at by ourselves, with the exception of the Compositæ, which are named on the authority of Dr Schultes of Zweibrucken (Bipont.)

It appears, according to the before mentioned determinations, that there are found in the entire collection, not only twenty new genera, but also more than two hundred hitherto undescribed species, besides very many others highly interesting on account of their rarity; illustrating in part the work of Forskahl, published some time ago; partly the species recently made known by Fresenius in the Museum Senkenbergianum, or in the well known work of the English traveller, Bruce: in the whole there are four hundred and twenty numbers, and all those subscribers who have paid at least one hundred and twenty florins, will receive four hundred species or numbers by this means: the whole collection will be distributed among the several claimants in as fair a proportion as

possible, according to the sums they had advanced; in the like proportion, subscribers of ninety, sixty, and thirty florins, will receive three hundred, two hundred, and one hundred species respectively; but all the subscribers will still retain a further claim upon the continuation of the Schimperian collection, when (as we hope,) they shall have safely arrived. Under favourable circumstances, we flatter ourselves therefore with the prospect that the subscriptions already realized will enable us to distribute, in the long run, these valuable and highly interesting plants at a cost to the subscribers not exceeding fifteen florins per hundred. Still the accomplishment of this hope will depend in a great measure on the manner in which the expenses attending the expedition of Kotzchy are met;—those latter (viz., Kotschy's) plants, which are of great interest, collected in Genaar, Chartum and Cordofan, are already on the way: intelligence of the departure thereof from Alexandria by an Austrian ship to Trieste, lately received, announces to us that the consignment includes no fewer than thirty thousand specimens, and consists of five hundred species, from which collections may be made up of five hundred, four hundred, and three hundred species each. By our contract with Kotschy, we find ourselves enabled to supply these collections at the low price of fifteen florins per century; therefore we now offer the same, and beg for early orders from our honoured members and all other friends of Botany, for collections respectively at seventy-five, sixty, and forty-five florins, post free, and, as usual, the payment in advance: we earnestly hope for kind and liberal support in this undertaking also, especially as it stands in so close connexion with the before-mentioned Abyssinian expedition, and indeed, to a certain extent, with it, forms one entire set of plants. We venture to look for the favour of new subscriptions for Kotschy's plants, as the very great expenses incurred by Schimper's journey are not yet defrayed.

Though pleasing and highly promising as it certainly is for science, that the courageous Schimper remains so long in Abyssinia, yet this prolonged sojourn did not enter

into the original idea, plan, wishes or instructions, of the directors, whose resources are consequently much straitened by the continued stay of the traveller; and the longer he stays the more embarrassed will their circumstances become.

The last direct intelligence received from Wilhelm Schimper, is dated Adoa, 6th Sept., 1839, to which place he had returned from Massova in order to make a further excursion into the Samon Alps, where, though through indirect intelligence, we learn that he was last summer met with, busily engaged in gathering together his collections, in tolerable health, though suffering in some degree from his eyes.

There still remains for us to present to the honourable Members of the Unio Itineraria, some news relating to the undertaking of Dr Fried. Welwitsch to the Azore and Cape Verd Islands. Dr F. W. had found himself, on several accounts, induced to limit his researches and collections, hitherto, to the neighbourhood of Lisbon, with occasional excursions further into Portugal, principally because having met with so many novelties and rarities, it appeared to him wrong altogether to pass them by; at the same time he hoped through his lengthened stay in Lisbon, to have the opportunity of making himself known there, and thereby ensure a greater degree of protection, from the Portuguese government, for travelling through the Azore Islands with greater success,—a hope which is now about to be fulfilled. Two cases of his Portuguese plants are now on their way from Hamburgh, as advice has already reached us to that effect, and we are now ready still to receive subscriptions, as we before announced, of forty-eight florins, and twenty-four florins, for proportionate collections.

Of the Georgio-Caucasian plants collected by Hohenacker, the last portion (viz. the sixth), is now ready for distribution, and will forthwith be forwarded to such of the subscribers as have not yet received it; a few sets of this portion, consisting of eighty species, are still disposable for twelve florins; besides these are also sets of the fifth delivery of two hundred species for twenty-five florins, and a few of the entire collections of four hundred species for forty-eight

florins, are still to be had; and lastly, a few centuries of North American plants from the Ohio district, at twelve florins each.

PROFESSOR HOCHSTETTER.
DR ERN. STEUDEL.

ESSLINGEN, *30th Nov.* 1840.

Immediately after our Report of the 30th November was printed, we received from the mercantile house in Alexandria, through which our intercourse with M. Schimper is carried on, the very pleasing intelligence that the second consignment of his Abyssinian Botanical Treasures, consisting of twenty-four cases, had safely arrived in Cairo. Through the same channel we are now also in possession of letters from the traveller himself, dated Adoa, July 8th, 1840, from which we learn that he is still full of zeal to devote himself further in the cause of science. By this it will be seen that the hopes expressed in our Report of 30th ultimo, will soon be realized; for we have little fear that the collections, having safely reached Cairo, will now be lost.

With steady perseverance our traveller will now follow his object, and to a much further extent than we originally anticipated; he will now travel up the Nile to its source, and there continue his collections. One reason which has induced him to continue his researches through the higher and alpine district is, a wish to avoid a prolonged stay in the lower country bordering the Red Sea, where he would be much more exposed to the plague and other epidemic diseases so prevalent there.

He most urgently appeals to us for further supplies, in order still to prosecute his researches. We however find it utterly impossible to send him any more money, unless our honoured Members speedily enable us to do so, by further advances. We therefore once more earnestly beg on his behalf for additional supplies, as thereon depend the life and health of this traveller, who has rendered so great and valuable services, not only to botany and geography, but now thinks to crown the whole of his arduous exertions by tracing

*Spiranthes diuretica.*

*Pleurothallis peduncularis.*

*Epidendrum porphyreum L.*

the Nile up to its source. Such a purpose appears to call for assistance and support, not only from friends of science, but from all who would benefit mankind in general. We believe that from our long Directorship of the Unio Itineraria concerns, we have in some degree gained the privilege of making such an appeal; and we also think it our duty earnestly to plead for our traveller, from feeling assured that his courage, his objects, and his past services, will meet with the sympathy of every Naturalist.

A MS. of twenty large sheets, containing one portion of the journal of his Abyssinian enterprise, now lies at Alexandria, and will very shortly reach us.

At the same time, we can also, in accordance with a notice received, announce that the consignment of Kotschy's Plants has not only reached Trieste safely, and passed quarantine, but has also been thence despatched to us on the 4th instant, and insured.

PROF. HOCHSTETTER.
DR STEUDEL.

ESSLINGEN, *9th Dec.* 1840.

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## XXII.—*New or Rare* ORCHIDEÆ.

TAB. VII.—XII.

(*Continued from page* 275 *of Vol. I.*)

### EPIDENDRUM.

1. E. *porphyreum* (Lindl.;) foliis distichis oblongis acutissimis, squamis spathaceis dense imbricatis acuminatis pedunculo longioribus, panicula acuta simplici multiflora, floribus corymbosis, sepalis oblongis acutis lateralibus fulcatis, petalis lineari-spathulatis, labelli trilobi laciniis lateralibus rotundatis intermedia quadrata bidentata, disci axi elevata basi et apicem versus bicallosa. (TAB. VII. VIII.)—Lindl. *Journ. of Bot.* vol. iii. *p.* 86.

HAB. Woods on the Western side of Pichincha, Andes of Columbia.—*Prof. W. Jameson.*

Fig. 1. Flower, f. 3. column and lip; *magnified.*

## Pleurothallis.

1. P. *peduncularis;* caule erecto gracili vaginato apice unifoliato, folio oblongo coriaceo, flore solitario infra apicem pedunculi erumpente, sepalis oblongis coriaceis inferioribus duplo angustioribus intus maculatis, petalis ovatis erectis maculis apice pubescentibus sepalis duplo minoribus, labio erecto ovato petalis duplo minore subrecurvo intus maculato basin versus canaliculato, columna brevi apice bidentata, anthera hemisphærica pubescente. (Tab. IX.)

Hab. Guatemala. *Mr Skinner.* Cult. in Hort. Woburn.

Of this group of *Pleurothallis,* with a solitary leafy and sessile, or nearly sessile flower arising from just below that leaf, there are several very remarkable species on the Pacific side of tropical America. The present does not correspond with any one described by Dr Lindley or Dr Poeppig.

Fig. 1. Flower; f. petals and labellum; f. 3. column and labellum; f. 4. the same; f. 5. anther-case; f. 6. pollen-masses; *magnified.*

## Epidendrum.

1. E. *leiobolbon;* pseudobulbis ovatis lævissimis superne in caulem brevem diphyllum attenuatis, squamis membranaceis duobus vaginatis, foliis alternis lineari-oblongis acutis submembranaceis obscure striatis, pedunculo terminali bifloro, sepalis petalisque conformibus spathulatis, (labelli triquetri) columna triquetra apice obtuse tridentata dente superiore longiore, labelli ungue lineari fere ad basin libero, lamella deflexa triloba lobis lateralibus parvis angustis intermedio magno transverso bilobo ad basin tuberculo subtriangulari, anthera immersa. (Tab. X.)

Hab. Mexico. *Galeotti.* Cult. in Hort. Woburn.

A very distinct species from any with which I am acquainted. The sepals and petals are spread horizontally and are of an uniform chocolate brown, inclining to green. Column projecting, triangular, yellow-green, except the apex which is flesh-coloured with red dots, and where it is cut into three

*Epidendrum leiobulbon.*

*Epidendrum Vincentinum.*

teeth, the upper one longer than the rest; and it is within these that the anther-case is, as it were, sunk. Claw of the pale yellow lip free almost to the very base, but close pressed to the under face of the column; the lamina deflexed, broad, with a tooth or small lobe on each side, transversely obcordate. The colour is deep yellow where the base of the lamina is applied to the stigma, and there is a projecting crest or tubercle, of nearly a triangular form.

Fig. 1. Column lip; f. 2. lip; f. 3. column; f. 4. anther-case; f. 5. pollen-masses, *magnified.*

2. E. *Vincentinum* (Lindl.;) caule ancipiti, foliis distichis anguste lanceolatis acutissimis panicula pauciflora laxa filiformi brevioribus, sepalis lineari-lanceolatis, petalis filiformibus, labello subrotundo crispo. (Tab. XI.)—Lindl. in Hook. *Journ. of Bot.* vol. iii. *p.* 88.

Hab. St Vincents. *Rev. L. Guilding.*

A small delicate species, not more than four inches high, with minute membranous flowers, disposed, in a short loose panicle; pedicels filiform.—*Lindl.*

Fig. 1. Flower; *magnified.*

## Spiranthes.

1. S. *diuretica* (Lindl.); foliis ensiformibus omnibus radicalibus, scapo glabriusculo vaginis brevibus distantibus acutis, spica densa elongata conica tomentosa, bracteis ovatis acuminatis florum longitudine, sepalis acuminatis apice glabris, labello pubescente oblongo basi cucullato apice subrotundo dilatato papilloso undulato.—Lindl. Gen. et Sp. Orchid. *p.* 468.

Spiranthes Nuil, Rich. Orch. Annot. *p.* 39.

Neottia diuretica, Willd. iv. *p.* 73.

Epipactis floribus uno versu dispositis, vulgo Nuil. Feuill. Peruv. ii. *p.* 26. *t.* 17.

Hab. Chili. *Feuillée. Macrae, Bridges.* (*n.* 607.)

Flowers pale green in conical spikes from 2-4 inches long. Stems to 1½ foot long.—*Lindl.*

Fig. 1. Flower; f. 2. front view of do.; f. 3. labellum; f. 4. Stigma and Anther; *magnified.*

## XXIII.—Contributions *towards a* Flora *of* South America, *and the Islands of the* Pacific. By Sir W. J. Hooker, K.H., LL.D., and G. A. Walker Arnott, Esq., LL.D.

### I. Extra-Tropical South America.

*(Continued from page 47, of the present Volume.)*

### Trib. VIII. Senecionideæ, *Less.**

1121. (1.) Xanthium *macrocarpum, DC. Fl. Fr. et Prodr.* v. *p.* 523.—*X. orientale, Linn. fil.*—Buenos Ayres; *Tweedie.* Quillota, Chili; *Bridges,* (*n.* 514). Mendoza; *Dr Gillies.*

1122. (2.) X. *spinosum, L.—DC. Prodr.* v. *p.* 523.—X. *catharticum, H.B.K. Nov. Gen. Am.* iv. *p.* 274. *DC. Prodr. p.* 523.—Desaguadero, Province of San Luis, and Mendoza; *Dr Gillies.* Chili; *Bridges,* (*n.* 511.) *Cuming,* (*n.* 90.) Buenos Ayres; *Tweedie.*—We scarcely think Humboldt's plant can be distinct from ours. Cathartic powers are stated by Humboldt to be attributed to it. Tweedie remarks that it has the property of rendering meat that has been almost putrid, sweet.

1123. (3.) X. *ambrosioides* (Hook. et Arn.); spinosum tomentoso-incanum, caule procumbente, foliis bipinnatifidis, segmentis oblongis obtusis margine revolutis, capituli fœminei solitarii aculeis tenuibus setiformibus patentibus apice uncinatis, spina terminali valida recta.—β. capituli fœm. spina valida nulla.—Los Caldanes, Province of Cordova; *Dr Gillies.* Buenos Ayres; *Tweedie.*—This very distinct species has the finely cut foliage of *Ambrosia,* and the fruit of *Xanthium.* The terminal spine of the female capitulum is frequently wanting.

1124. (1.) Ambrosia *tenuifolia, Spr.—DC. Prodr.* v. *p.* 527.—Saladillo to El Morro, province of San Luis; *Dr Gillies.* Buenos Ayres and Maldonado; *Tweedie,* (*n.* 1055.)

* It will be borne in mind that our general arrangement of the *Compositæ,* is that of Lessing; our mst. having been prepared, and much of it printed before the publication of the 5th and 6th volumes of De Candolle's *Prodromus.*

1125. (2.) A. *Chilensis* (H. et A.); caule incano, foliis pinnatifidis supra pubescentibus subtus canescentibus laciniis oblongis inferioribus sæpe inciso-pinnatifidis superioribus inciso-serratis, segmentis ultimis serraturisque acutis, racemis solitariis.—Valparaiso; *Cuming*, (*n.* 784). Coquimbo; *Macrae.*

1126. (3.) A. *scabra* (H. et A.); caule scabro, foliis pinnatis supra calloso-scabris subtus hirsuto-pubescentibus, laciniis lineari-lanceolatis acutis inferioribus inciso-pinnatifidis, racemis solitariis in paniculam foliosam quandoque dispositis. —*A.* fruticosa, *β. DC. Prodr.* v. *p.* 526?—*α. tenuior;* foliorum segmento terminali lineari-acuminato.—*β. robusta;* foliorum laciniis latioribus, segmento terminali lanceolato.—*α.* Buenos Ayres and Entra Rios, in pasture-fields; *Tweedie.*—*β.* Buenos Ayres; *Tweedie.*—Probably this is the *A. fruticosa β. intermedia*, of De Cand.; but we nevertheless think it a distinct species.

1127. (4.) Blennosperma *Chilense, Less. Syn. p.* 276.—*DC. Prodr.* vii. *Mant. p.* 288.—Apalus anthemifolius, *DC. Prodr.* v. *p.* 508.—"Unxia anthemifolia, *Bert. Herb.*" *Colla Mem. Acad. Taur.* 38. *p.* 37. *n.* 77. *t.* 32.—Soliva radiata, *Poep. Fl. Exsicc. n.* 210.—Valparaiso and Quepay, Chili; *Mathews*, (*n.* 251.) *Bridges*, (*n.* 447 and 448.) *Cuming*, (*n.* 694.)—Lessing places this genus among the *Artemisieæ;* De Candolle near *Unxia.* We have followed the latter author, on account of the conspicuous ligulate florets of the ray.

1128. (1.) Parthenium *Hysterophorus, L.*—*DC. Prodr.* v. *p.* 532.—Argyrochæte bipinnatifida, *Cav.*—Province of San Luis and Mendoza; *Dr Gillies.* Buenos Ayres, Parama, Uraguay and N. Patagonia; *Tweedie*, (*n.* 1054.)

### Subtrib. II. Heliantheæ. *Less.*

1129. (1.) Zinnia *pauciflora, L.*—*DC. Prodr.* v. *p.* 535.—Province of San Luis; *Dr Gillies.*

1130. (1.) Jægeria *hirta, Less.*—*DC. Prodr.* v. *p.* 544.—Acmella hirta, *Lag.*—Moist woods of the Bande Orientale; *Tweedie.*

1131. (1.) Pascalia *glauca, Orb. Dec.* iv. *p.* 39. *t.* 4.—*DC.*

*Prodr.* v. *p.* 549.—Mendoza and La Aguadita, province of San Luis; *Dr Gillies.* Buenos Ayres and Monte Video; *Tweedie*, (*n.* 372.)—Pappi paleæ paucæ, breves, 1—2 longiores ut in *Helianiho*, sect. *Harpalio*, at omnes in pappum coroniformem coalitæ, haud, ut in *Helianiho*, liberæ.—All authors indicate Chili as the native country of this plant; probably Mendoza is meant in those cases; for we have not seen any specimens from the Chilian side of the Andes.

### Scalesia.* *Arn.*

*Capitulum* homogamum. *Involucrum* subbiseriale. *Receptaculum* paleaceum. *Paleæ* lineares. *Antheræ* nigricantes, exsertæ, ecaudatæ, alis cordato-oblongis. *Stylus* Tagetis (i. e. alte bifidus, ramis sursum latioribus, cono acuto superatis, pube e coni basi sursum adscendente deorsumque descendente.) *Achænium* compressum, obcordatum, omnino calvum, conforme, glabrum, disco epigyno inconspicuo.—Frutex *ex insulis Gallipagensibus.* Folia *lineari-lanceolata, utrinque attenuata, alterna, supra scabriuscula, subtus pubescentia, integerrima.* Capitula *basi subintrusa, axillaria, breviter pedunculata.*

1132. (1.) Scalesia *atractyloides*, *Arn. in Lindl. Nat. Syst. p.* 443. *DC. Prod.* vii. *p.* 308.—*Hook. ic. ined.*—Gallipagos; *Cuming*, (*n.* 106.).—A very distinct genus unlike any with which we are acquainted. Leaves 4—6 inches long, much attenuated at both extremities, subsessile, penninerved, scabrous above, downy and paler beneath. Capitula nearly an inch broad. Involucre campanulate, slightly downy. Corollas all tubular, pale, apparently white. Anther-tube exserted, black, tipped with white. *Paleæ* nearly as long as the florets, linear, rigid.

1133. (1.) Encelia *oblongifolia*, *DC.* v. *p.* 567.—Chili; *Hænke. Gaudichaud. Macrae.* Coquimbo; *Cuming*, (*n.* 909.)—Intermediate, as it were, between *E. parvifolia*, and *E. canescens.*

1134. (1.) Leptocarpha *rivularis*, *DC. Prodr.* v. *p.* 495.

* This ought, strictly speaking, to be excluded from the Flora we are now describing.

Helianthus rivularis, *Poep. Pl. Exsicc. n.* 716.—Tetrachæte Chilensis, (*H. et A.*) mst.—Banks of the River Valdivia, Chili; *Bridges,* (*n.* 764.)—The leaves are slightly scabrous on the upper side; the ovaries in our specimens are young, but appear to have a pappus of four equal bristles, so very caducous, that we have seldom been able to detect the whole number, although the marks where the others have existed are visible. De Candolle describes the mature achenium with only two bristles. The branches of the style of the disk are tipped with a very short fleshy cone, on which account we have placed the genus with the *Senecionideæ,* while De Candolle places it in *Asteroideæ,* near *Siegesbeckia.*

### Leighia. *Cass.*

* *Foliis alternis.*

1135. (1.) Leighia *anchusæfolia* (*DC. Prodr.* v. *p.* 580); herbacea strigoso-pubescens, foliis alternis sessilibus calloso-strigosis lineari-oblongis subintegerrimis triplinervibus, nervis lateralibus prope margines, pedunculis corymbosis elongatis parve-foliatis, involucri 3—4-serialis strigosi disco brevioris foliolis oblongo-lanceolatis ext. minoribus apice recurvis, achenio parce sericeo.—Top of the hill of Monte Video; *Tweedie,* (*n.* 865.)

1136. (2.) L. *stenophylla* (H. & A.); herbacea strigoso-hispida, foliis alternis subsessilibus linearibus integerrimis trinerviis, nervis lateralibus marginalibus subobsoletis, pedunculo solitario paullo ante apicem aphyllo, involucri disco brevioris canescentis pluriserialis foliolis lanceolatis acuminatis ext. apice recurvis, achenio parce sericeo.—Buenos Ayres and Monte Video; *Tweedie,* (*n.* 870 and 875.)—Perhaps our plant is the same as *L. immarginata, DC. Prodr. p.* 581.; but the stem is scabrous, and the marginal nerves of the leaves can always be traced.

1137. (3.) L. *Gilliesii* (H. & A.); suffruticosa? scabra, foliis alternis brevi-petiolatis anguste lanceolatis attenuatis basi in petiolum acuminatis integerrimis trinerviis, nervis lateralibus prope marginem, pedunculo solitario valde elon-

gato longe ante apicem aphyllo, involucri discum subæquantis setis copiosis scabri pluriserialis foliolis omnibus acuminatis exterioribus recurvis, achenio parce sericeo, paleis receptaculi apice hirsutis mucronatis.—Helianthus heteropappus, *Gill. mst.*—San Pedro, Mendoza; *Dr Gillies.*

1138. (4.) L. *Tucumanensis*, (H. et A.); ramis fruticosis glabris sulcato-angulatis, foliis alternis lineari-elongatis utrinque attenuatis integerrimis sessilibus uninervibus supra scabris subtus læviusculis, pedunculis elongatis bracteatis glabris ex axillis prope apicem ramorum folium subæquantibus, involucri discum subæquantis foliolis ovato-acuminatis profunde striatis inferne glabriusculis erecto-imbricatis versus apicem herbaceis pubescenti-ciliatis subrecurvis, acheniis glabris marginibus obscure sericeis.—Near Tucuman; *Tweedie*, (*n.* 1203.)—Leaves frequently 6-7 inches long. Involucral scales deeply furrowed, and almost wholly glabrous. Pappus of 4-5 unequal acuminated paleæ.

** *Foliis oppositis.*

1139. (5.) L. *buphthalmiflora*, (De Cand. *Prodr.* 5. *p.* 583?) herbacea hispida, foliis oppositis plus minusve linearibus v. oblongis acutis v. acuminatis subinciso-serratis supra subtusque inter venas glabris, pedunculo elongato solitario, involucro discum subæquante biseriali, foliolis subæquilongis hispidis adpressis oblongis foliaceis, achenio subpiloso, pappo brevi, paleis receptaculi membranaceis acuminatis.—L. bupthalmoides. *Hook. et Arn. mst.*—β. foliis linearibus.—Banda Orientale, San Isidro, Rio Grande, and Buenos Ayres, and Uraguay; *Baird; Tweedie; M. Isabelle.*—β. Maldonado; *Tweedie.*—Flowers large, showy. The leaves are certainly very variable both in the toothing and in breadth. Perhaps *L. calendulacea, DC.*, may be a state of this very common plant of South Brazil and the Platte river.

1140. (6.) L. *Silphioides* (H. & A.); herbacea? hispida, foliis petiolatis oppositis in petiolum decurrentibus, caulinis sagittato-ovatis inciso-dentatis angulatisque, superioribus hastato-oblongis serratis, omnibus supra venisque subtus calloso-hispidis subtus inter venas velutinis vel dense pubescen-

tibus, pedunculis subternis, involucro discum subæquante biseriali hispido, foliolis æquilongis lineari-oblongis acutis, achenio parce piloso.—Buenos Ayres; *Tweedie; Dr Gillies.*

1141. (1.) Flourensia *thurifera, DC. Prodr. p.* 592.—Helianthus thurifer, *Mol.*—H. glutinosus, *Hook. et. Arn. Bot. Beech. Voy. p.* 32.—Conception; *Mr Caldcleugh; Mr Cruickshanks.* Valparaiso; *Bridges,* (n. 234.) *Cuming,* (n. 631.)

1142. (2.) F. *corymbosa, DC. Prodr. p.* 592.—Helianthus corymbosus, "*Poep. Pl. exsicc,* (*n.* 791.)"—H. Cumingii, *H. & A. mst.*—Chili; *Poeppig.* Maule province; *Cuming,* (*n.* 849.)

1143. (1.) Bidens *glaberrina, DC. Prodr. p.* 601.—Buenos Ayres; *Tweedie.*

1144. (2.) B. *bipinnata,* L.—*DC. Prodr.* 5. *p.* 603.—Mendoza and Buenos Ayres; *Dr Gillies; Tweedie.* Valparaiso; *C. Darwin, Esq.,* (*n.* 382); *Bridges,*(*n.* 661); *Cuming,* (*n.* 646.)

1145. (3.) B. *Chilensis, DC. Prodr. p.* 683.—Chili; *Cruickshanks.*

1146. (4.) B. *helianthoides, Kunth.*—*DC. Prodr. p.* 596; Marshes, Quillota; *Bridges,* (n. 67.) Buenos Ayres; *Dr Gillies; Tweedie.*

1147. (1.) Verbesina *glabrata,* (H. & A.); ramis herbaceis, foliis alternis oblongo-lanceolatis acuminatis basi in petiolum longiuscule attenuatis pubescentibus demum glabris sinuato-serratis, serraturis calloso-apiculatis, corymbis multifloris, involucri glabri foliolis exterioribus obtusis interioribus acutiusculis, acheniis radii discique biaristatis.—St Catharine, Brazil; *Tweedie.*—Leaves 4-5 inches long. Its place will be near *V. sordescens, DC.*

1148. (2.) V. *sordescens, DC. Prodr.* 5. *p.* 613.—Plentiful in the mountains of Rio Jacquety; *Tweedie,* (n. 878.)

1149. (3.) V. *auriculata* (H. & A.); herbacea, foliis (ramorum) alternis sessilibus oblongo-lanceolatis subpanduriformibus basi auriculatis versus apicem calloso-serratis supra pubescentibus subtus incano-subvelutinis, corymbis multifloris, involucri canescentis foliolis exterioribus obtusis interioribus acutis, acheniis radii discique biaristatis.—V. subcordata, *DC. Prodr. p.* 614?—Buenos Ayres; *Tweedie.*

**1150.** (4.) V. *helianthoides* (H. & A.); herbacea? foliis (ramorum) oppositis hirsutis inferioribus oblongis superioribus lineari-lanceolatis dentatis, pedunculis solitariis versus apicem villosis, involucri laxi foliolis exterioribus villosis spathulatis acutis basi attenuatis internis glabriusculis acuminatis, radio discum superante, acheniis radii triaristatis disci biaristatis.—Dry pasture-fields in the interior of Entro Rios; *Tweedie.*

1151. (1.) Oligogyne? *Synedrelloides,* (H. & A.); herbacea parce strigilloso-pubescens, foliis oppositis petiolatis ovatis acutis serratis, pedunculis petiolum raro superantibus in dichotomia solitariis ad ramorum apices ternis, involucro subbiseriali, foliolis exterioribus majoribus elliptico-oblongis acutis, radio brevi, acheniis obcompressis radii brevissime disci longiuscule biaristatis.—Rio Grande; *Tweedie.*—This may possibly be the *O. Megapotamica, DC. Prodr.* 5. *p.* 629; but the involucre is not decidedly in a single row as he characterizes the genus. It has quite the habit of *Synedrella nodiflora.*

1152. (1.) Ximenia *microptera, DC. p.* 627.—X. enceloides, *Don, in litt.* (*non Pav.*)—Cerro del Diamante, Mendoza; *Dr Gillies.* Buenos Ayres; *Tweedie.*—Herba annua, canescens. Folia opposita et alterna, sublonge petiolata, integra, subangulato-ovata, inæqualiter serrata, subtus incano-strigillosa, basi in petiolum subdecurrentia. Petioli basi exauriculati. Pedunculi 1—3-ni, terminales.—This differs from *X. enceloides,* Cav., at first sight, by the petioles not expanding into foliaceous auricles at the base. The bristles at the apex of the ovary are very small, inconspicuous, and easily broken off, but we fear that character is not constant. Indeed Cavanilles himself has represented the original species in the same way, although in the cultivated specimens of it, in our Herbarium, we find always very decided awns. Kunth describes the ray as neuter in the new species he refers to this genus: Cavanilles makes it female, as does Lessing, who, however, suspects the achenium to be unfertile; but we possess specimens having the achenia of the ray perfect. It is ovoid, much warted and wrinkled, without any wing. It

is therefore probable that the species with a neuter ray ought to be referred to *Coreopsis*, or that *Simsia* ought again, as Cassine and De Candolle suggest, to be restored for them.

1153. (1.) Spilanthes (Salivaria) *Macræi* (H. & A.); stolonifera, foliis lineari-spathulatis obtusiusculis sessilibus utrinque glabris vel pilis brevibus raris adspersis versus basin ciliatis, pedunculo foliis vix duplo longiore pilis brevibus plus minusve adsperso, involucri foliolis ovalibus interioribus apice erosis, radio nullo, disco hemispherico.—S. leiocarpa, *DC. Prodr.* 5. *p.* 626?—Conception, Chili; *Macrae.*—*S. leiocarpa*, DC. agrees tolerably well with this, and it is also a plant of Macrae; but, as stated by De Candolle, discovered "ad Sinum Chorillo in Peru," whereas ours is from Chili.

1154. (2.) S.(Salivaria) *pusilla*, (H. & A.); repens, foliis spathulato-linearibus obtusiusculis basi in petiolum attenuatis glaberrimis, pedunculo foliis duplo longiore versus apicem subpubescente, involucri foliolis late ovalibus margine scariosis minute fimbriatis, radio nullo.—Road-sides about Buenos Ayres; *Dr Gillies.* Banda Orientale; *Tweedie.*

1155. (3.) S. (Acmella) *helenioides*, (H. & A.); erecta glabra, foliis oblongis lineari-lanceolatis linearibusve calloso-apiculatis basi attenuatis integerrimis vel utrinque sub-dentatis, pedunculis valde elongatis, radii flosculis patenti-recurvis apice trifidis disco subcylindrico longioribus.—Mendoza and Buenos Ayres; *Dr Gillies.* Uraguay and Rio Grande; *Tweedie,* (*n.* 864, 858, and 867.)

1156. (4.) S. (Acmella) *affinis*, (H. & A.); decumbens, caule glabro, foliis linearibus utrinque attenuatis calloso-apiculatis hinc inde calloso-denticulatis, pedunculis elongatis versus apicem dense pubescentibus, flosculis radii discum conicum subæquantibus obtuse tridentatis.—Los Loamos in N. Patagonia; *Tweedie* (*in Herb. Arn.*)—Very nearly allied to *S. stenophylla*, and to *S. helenioides*, but the florets of the ray are only toothed, not trifid.

1157. (5.) S. (Acmella) *stenophylla*, (H. & A.); decumbens glabra, foliis angustissime linearibus calloso-apiculatis hinc

inde minutim denticulatis, pedunculis subelongatis, flosculis radii patentibus apice minute tridentatis discum conicum subæquantibus.—Buenos Ayres; *Tweedie.*—Leaves very narrow, crowded.

1158. (6.) S. *wedelioides*, (H. & A.); decumbens, caule pedunculis petiolisque strigoso-pubescentibus, foliis obovato-oblongis trinerviis basi in petiolum breviusculum paullum attenuatis glabris margine scabridis integerrimis, pedunculo gracili, capitulo basi subtruncato, flosculis radii (pallidis) oblongis involucrum haud superante, rachidis bracteolis subulatis corollas disci superantibus, ovarii marginibus inferne glabriusculis apice villosiusculis, setis perbrevibus mucroniformibus!, styli ramis subtruncatis pube descendente obsessis! —Within the tide of La Plata. *Tweedie*, (*in Herb. Arn.*)—The style has no appendage or cone; but its pubescence is not manifestly longer than the apex, as in the true species of the genus. The external appearance of the style is thus more of the *Asteroideæ* than of the *Senecionideæ;* but the stigmatic lines reach to about the apex, and therefore much beyond the commencement of the pubescence.

### ADENOSPERMUM. *H. & A.*

Adenocarpus. *Don*, *mst.* (*non DC.*)

GEN. CHAR. *Capitulum* heterogamum. *Involucrum* duplici ordine 10-phyllum, æquale, foliolis oblongis obtusis margine membranaceis. *Styli rami radii* lævissimi breves exappendiculati, *disci* appendiculis linearibus longissimis superati. *Achenium* verrucosum erostre, *radii* cylindricum exalatum calvum, *disci* obcompressum bialatum, alis apice in mucrones tuberculiformes brevissimos ac lævissimos excurrentibus. *Rachis* bracteolata.

1159. (1.) A. *tuberculatum*, (H. & A.)—Adenocarpum tuberculatum, *Don*, *mst.*—Province of Cordova; *Dr Gillies*. Cordova; *Tweedie*, (*n.* 1109).—A small, procumbent, herbaceous plant, with the habit of *Heterospermum pinnatum*. Leaves alternate, on long petioles, tripinnatifid, strongly nerved and reticulated, pellucid in the areolæ; segments linear-lan-

ceolate, very acute or mucronate. Capitula small, hemispherical, on axillary and terminal peduncles. The genus is very closely allied in character to *Isostigma* of Lessing, and indeed only to be distinguished by the achenia and styles: but in habit the two genera are totally dissimilar.

1160. (1.) Thelesperma *scabiosoides*, Less.—*DC. Prodr.* v. *p.* 634.—Bidens paradoxa, *Don, mst.*—B. megapotamia, *Spr.* —Uraguay and N. Patagonia; *Baird; Tweedie.* Province of Cordova; *Dr Gillies.*

1161. (1.) Isostigma *peucedanifolium*, Less.—Tragoceras peucedanifolium, *Spr.*—Dry hills of the Jacquety, Rio Grande and Portalegre; *Tweedie.*—Lessing remarks that the corolla of the ray is more or less 3-toothed; in one specimen before us it is trifid, and in another almost tripartite.

## Subtrib. III. Flaverieæ.

1162. (1.) Flaveria *Contrayerba*, *Pers. Sims. Bot. Mag. t.* 2400.—*DC. Prodr.* v. *p.* 635.—F. Bonariensis? *DC. Prodr.* —Chili; *Menzies*; *Cuming*, (*n.* 778); *Bridges*, (*n.* 491); Mendoza; *Dr Gillies*, (who observes that the plant is commonly used immersed in a solution of alum for dyeing yellow or green.) Buenos Ayres; *Tweedie.*

## Subtrib. IV. Tagetineæ. *Less.*

1163. (1.) Tagetes *glandulifera*, *DC. Prodr.* v. *p.* 644. T. minuta, *L.*—Mendoza; *Dr Gillies.* Valparaiso; *Cuming*, (*n.* 777.); *Bridges.* Buenos Ayres; *Tweedie.* Valparaiso; *Menzies; Bridges.*

1164. (2.) T. *pauciloba*, *DC. Prodr.* v. *p.* 644.—Cerro del Diamante, Mendoza; *Dr Gillies.* South Chili? *C. Darwin, Esq.*, (*n.* 280.)

1165. (3.) T. *micrantha*, *Cav.*—*DC. Prodr.* v. *p.* 646.—Mendoza; *Dr Gillies.*

1166. (1.) Lasthenia *Kunthii*.—Hymenatherum Kunthii, *Less. Comp. p.* 237. *DC. Prodr.* v. *p.* 642.—Rancagua Bridgesii, *Poepp. et Endl. Nov. Gen. t.* 25.—Lasthenia obtu-

sifolia; β. Bridgesii, *DC. Prodr.* v. *p.* 665.—Valparaiso and Quepay; *Bridges*, (*n.* 449.); *Cuming*, (*n.* 724.)—Our plant is certainly the *Hymenatherum Kunthii* of Lessing, and we prefer his specific name as he is the first describer of it. It is certainly the *Rancagua Bridgesii* of Endlicher and Poeppig, although our plant is not glabrous, and the paleæ of the pappus are narrow linear-subulate, and very obscurely and simply serrated. The *R. Feuillei*, Endl. and Poepp., (*Lasthenia obtusifolia*, *α.* of DC.) has a different structure of the paleæ of the pappus, which are much shorter than the corolla, though the two plants are in other respects very similar.

1167. (1.) Hymenatherum *Candolleanum* (H. & A.); perennis pubescens, ramis simpliciusculis, foliis oppositis sessilibus ad basin subpalmatis pinnato-partitis lobis sub 5 spinoso-filiformibus rigidis integerrimis inferioribus minoribus terminali elongato, pedunculis elongatis 1-cephalis nudis, involucro biseriali 14—20-dentato, pappi uniserialis squamellis 10 omnibus basi membranaceis apice trifidis, lobo medio setiformi scabro, lateralibus brevibus membranaceis.—H. Belenidium, *DC. Prodr.* vii. *p.* 292.—Belenidium Candolleanum, *Arn. in DC. l. c.*—Pectis acicularis, *Don, mst.*—Mendoza; *Dr Gillies.*—Summit of high dry rocks of Los Loamos, N. Patagonia; *Tweedie.*—We almost incline to think that this may be the same as Cassini's *H. tenuifolium*, (from "Chili,") and the same as what De Candolle had from Née, (probably from Mendoza,) both of which De Candolle is inclined to refer to his *H. tenuilobum*, a Mexican plant. Lessing's genus *Hymenatherum*, it will be observed, is very different from this of Cassini, and is Cassini's *Lasthenia.*

### Subtrib. V. Helenieæ. *Less.*

1168. (1.) Bahia *ambrosioides*, Less.—*DC. Prodr.* v. *p.* 657.—Valparaiso; *Cuming*, (*n.* 769.) *Bridges*, (*n.* 60.) *Mathews*, (*n.* 168.)—Fruticulus dense pubescens. Folia opposita biternatim secta; segmentis cuneato-oblongis, acutis. Capitula corymbosa, heterogama, radio 5—9-flavo. Involucrum sub-

biseriale, sub-9-phyllum foliolis cuneato-rotundatis. Styli disci rami cono brevi carnoso glabriusculo apiculato superati. Achenium tetragonum, basi longe attenuatum, glabriusculum. Pappi paleæ 8—10, cuneato-obovatæ, æquilongæ, latitudine inæquales, apice obtusæ, vel truncatæ et eroso-dentatæ, corneo-membranaceæ.—Perhaps the genus *Bahia* ought to be restricted to this plant. *B. artemisiæfolia*, and probably all the other species from California and Mexico have truncated styles, as Lessing indeed defines *Bahia*, and belong to *Eriophyllum*, Lag., from which *Trichophyllum*, Nutt., is not distinct. *Erioph. trolliifolium*, having a pappus of 4 acute paleæ, seems to belong to *Hymenoxys*.

### AMBLYOPAPPUS. *H. et A.*

*Capitulum* homogamum. *Receptaculum* epaleaceum. *Involucri squamæ* 5, uniseriales, cuneato-obovatæ, obtusissimæ. *Corolla* brevis, 5-dentata. *Styli* rami cono brevi hirsuto superati. *Achenia* breviter turbinata, tetragona, glabriuscula. *Pappi* paleæ 8—10, cuneato-obovatæ, æquilongæ, latitudine paullo inæquales, obtusæ, muticæ, corolla paullo breviores, corneo-membranaceæ, pinnatifido-striatæ, eroso-denticulatæ. —Herba *annua pusilla glabra apice corymbose ramosa. Folia inferiora opposita, superiora alterna, subpedatim secta, segmentis angustissime linearibus obtusis. Capitula solitaria breviter pedunculato.*

1169. (1.) A. *pusillus*, (H. et A.)—Coquimbo, *Cuming*, (*n.* 885.)—This genus differs from *Achyropappus*, in the form of the style, the want of a ray, and habit; from *Florestina* by the absence of the subulate hairy appendages to the style; and from *Hymenopappus* by the involucre, the style, and the achenia. In character it is most allied to the original *Bahia*, but there is no ray, and the habit is totally dissimilar.

1170. (1.) Schkuhria *Bonariensis*, (H. et A.); puberula, foliis alternis 1—2-pinnatim sectis segmentis filiformibus, capitulis longe pedunculatis, involucro biseriali sub-7-phyllo, foliolis duobus exterioribus minoribus, flore femineo unico, corollis disci 5-dentatis, achenio basi hirsuto, pappi paleis 8

scariosis basi crassinerviis, 4 aristulatis, 4 obtusis paullo brevioribus.—S. abrotanoides, *Don*, (*non auct.*)—Pampas of Buenos Ayres; *Dr Gillies.* Buenos Ayres; *Tweedie.*—In this and the next species, the branches of the style are tipped with a short cone, and the achenia are remarkably hirsute at the very base, and sprinkled upwards with a few stiff hairs.

1171. (2.) S. *multiflora*, (H. et A.); strigoso-pubescens, foliis inferioribus oppositis superioribus alternis subtripinnatisectis, segmentis anguste linearibus obtusis, capitulis sublonge pedunculatis multifloris homogamis? involucro subtriseriali 12—18-phyllo foliolis subæqualibus, corollis 5-dentatis, achenio basi hirsuto, pappi paleis 8 subæqualibus scariosis basi crassinerviis, 4 obtusis v. acutiusculis, 4 setigeris. —Achyropappus schkuhrioides, *Don*, (*non Link.*)—Mendoza; *Dr Gillies.*—We do not find any ligulate floret in this species; but the ligules may have fallen off, as our specimens are considerably advanced.

1172. (1.) Jaumea *linearifolia*, *Pers.*—*DC. Prodr.* v. *p.* 663. —Kleinia linearifolia, *Juss. in Ann. Mus.* ii. *p.* 424. *tab.* 61. *f.* 1. (*non Linn.*)—In salt marshes of St Lucia and Monte Video, also at Bahia Blanca, N. Patagonia; *Tweedie.*—De Candolle, who does not appear to have seen the plant, describes the pappus of 8—10 squamellæ; but Jussieu correctly figures and describes the squamellæ as numerous.

1173. (1.) Cercostylis *scabiosoides*, (Arn.); foliis oblongolanceolatis acutis vel semel bisve pinnatifidis,—*Arn. in DC. Prodr.* vii. *p.* 293.—Cephalophora scabiosioides, *Don*, *mst.* (*ex parte.*)—El Morro, Province of San Luis, and at Saladillo, province of Cordova; *Dr Gillies.* Los Loamos of Bahia Blanca, N. Patagonia; *Tweedie.*

1174. (1.) Hymenoxys *anthemoides*, (Cass.?); herbacea glabra humilis divaricato-ramosa, foliis biternatim sectis vel superioribus alte trifidis segmentis filiformibus, involucro fructus connivente, squamis ovalibus obtusis serie interiore exteriorem superante, capitulis discoideis, pappi paleis ovalibus subiter acuminatis.—*DC. Prodr.* v. *p.* 661.—Buenos Ayres; *Tweedie.*—We have little doubt of this being Cassini's

plant, and the *Hymenopappus anthemoides* of Juss., although the remarkable tendency of the involucre to become connivent by age, has not been observed by any of these botanists. If it be really a distinct species, it may be named *H. connivens*. The branches and peduncles are deeply striated as in *H. Hænkeana*, from which it is distinguished by its more compound leaves.

1175. (2.) H. *Tweedei*, (H. et A.); herbacea glabra sub elongata decumbens, foliis anguste linearibus obtusis vel ad medium 2—3-fidis, capitulis radiatis, involucro campanulato squamis oblongo-ovalibus obtusis serie interiore subæquilongo, pappi paleis 5—6 oblongis sensim acuminatis.—Rio Grande, and dry pastures, road sides of Los Loamos, N. Patagonia; *Tweedie*, (*n*. 859.)—In this and the last species the inner leaflets of the involucre are coriaceous and flat, the outer ones slightly carinate at the base.

1176. (1.) Cephalophora *glauca*, *Cav.—DC. Prodr.* v. *p.* 662.—Valparaiso and Conception; *Cuming*, (*n*. 126, and 553.) *Bridges*, (*n*. 220.) Valdivia; *Bridges*, (*n*. 651.)—Casa Blanca, Chili; *Dr Gillies.*

1177. (2.) C. *aromatica*, *DC. Prodr.* v. *p.* 662.—Græmia aromatica, *Hook.*—Valparaiso; *Bridges*, (*n*. 219.) Buenos Ayres (cultivated;) *Tweedie.*—Although in deference to De Candolle, we retain these two species as distinct, we believe they are mere varieties, and that his *C. plantaginea* is another form. The difference pointed out in the shape of the leaves is certainly not permanent, and the only one we know lies in the annual or biennial duration of the root, and the size of the capitula; but this last is likewise variable. Both vary from glabrous to canescent; the lower leaves are toothed, the upper entire; those at the base of the ramifications, particularly in our specimens from Tweedie, are slightly decurrent.

1178. (3.) C. *heterophylla*, (*Less.—DC. Prodr.* v. *p.* 662); suffruticosa ramosa canescens, foliis linearibus vel dentato-pinnatifidis, involucri squamis adpressis, corollis radii 3-lobatis pallidis, disco purpurascente, pappi paleis circiter 10 elongatis, achenio argenteo-sericeo.—Buenos Ayres; *Tweedie*,

(*n.* 889.)—De Candolle has inadvertently made it a part of the generic character that the leaves of the involucre are always reflexed; whereas the greater part of his section *Actinella*, to which this and the next species belong, has them adpressed.

1179. (4.) C. *Doniana*, (H. et A.); canescens suffruticosa, foliis linearibus integris acutiusculis, involucri squamis adpressis, corollis radii trilobatis discoque concoloribus, pappi paleis 6—8 breviusculis, achenio fulvo-sericeo.—C. suffruticosa, *Don, mst.*—C. elongata, *Don, mst.* (*ex parte.*)—San Isidro, Mendoza, and Saladillo, province of Cordova; *Dr Gillies*, (*n.* 64, and 62, partly.)—Our specimens from Dr Gillies of what he informed us Mr Don has called *C. elongata*, belong partly to this species, and partly to *Cercostylis scabiosoides*. Several other species are suffrutescent, whence we have rejected the unpublished name given by Mr Don.

1180. (1.) Calea *pinnatifida, Br.—Less. in Linn.* v. *p.* 158, (*cum synon.*); *DC. Prodr.* v. *p.* 674.—St Catharines; *Tweedie*, (*n.* 1022.)—Some of our specimens from St Catharines, have the upper leaves quite entire, and agree with the description of *C. glabra*, DC., found there by Gaudichaud; but our plant has the leaves always more or less scabrous on the upper side.

1181. (2.) C. *cymosa, Less. l. c. DC. Prodr.* v. *p.* 674.—S. Brazil; *Tweedie*, (*n.* 1066, 1069.)—Our specimens accord with De Candolle's specific character, except that the upper leaves are occasionally slightly obtuse, and that the scales of the involucre are either obtuse or acute in the same corymb: the leaves are scabrous on both sides.

1182. (3.) C. *uniflora, Less. l. c. p.* 159.—*DC. Prodr.* v. *p.* 674.—Banda Orientale; *Tweedie*, (*n.* 865.)

1183. (4.) C. *pedunculosa, DC. Prodr.* v. 673.—C. uniflora, forma discoidea, (*Less. l. c. p.* 158.)—Banda Orientale; *Tweedie*, along with the last species.—Lessing is probably correct, when he unites these two species; the only difference lies in the presence or absence of a ray. The following description applies to both.—Folia sessilia, ovata vel ovato-

lanceolata, grosse dentata, utrinque scabra vel hirsuta, triplinervia: involucri foliola vittis longitudinalibus 5—7 purpureis oleo farctis lineolata: pappi paleæ utrinque attenuatæ, sæpissime secus strias pinnatifido-laceræ; receptaculi bracteolæ subsetaceæ, corneæ.

1184. (1.) Galinsogea *parviflora, Cav—DC. Prodr.* v. *p.* 677.—Wiborgia Acmella, *Roth.*—Valparaiso; *Cuming,* (*n.* 629.) *Bridges,* (*n.* 203.) Coquimbo; *Beechey.* Mendoza; *Dr Gillies.* Buenos Ayres; *Tweedie,* (*n.* 1092.)

Subtrib. VI. Chrysanthemeæ. *Less.*

1185. (1.) Anthemis *nobilis, L.—DC. Prodr.* vi. *p.* 6.—Buenos Ayres; *Tweedie.*—No doubt this and the two following were introduced from Europe.

1186. (1.) Maruta *fœtida, Cass. DC. Prodr.*—Anthemis cotula, *L.*—Mendoza; *Dr Gillies.* Buenos Ayres; *Tweedie.*

1187. (1.) Pyrethrum *Parthenium, L.—DC. Prodr.*—Mendoza; *Dr Gillies.*

1188. (1.) Cotula *Montevidensis, Spr.—DC. Prodr.* vi. p. 78.—Banda Orientale, within tidemark, opposite Monte Video; *Tweedie,* (*n.* 860.)

1189. (1.) Artemisia *Absinthium, L.—DC. Prodr.* vi. *p.* 125.—β. foliis subcarnosis.—A. andicola, *Don. mst.*—In a hedge at St Pedros of Rio Grande; *Tweedie,* (n. 1051.)—β. San Isidro, Andes of Mendoza, and frequent in the Quebradas above Mendoza, " where it is in common used as a medicine instead of wormwood;" *Dr Gillies.*—We cannot see that the *A. andicola* of Don's mst. is really different from the *A. Absinthium,* and the plant is probably an introduced one in the above stations. There is a South Brazilian species called *A. Montevidense* by Sprengel, very imperfectly described, and we doubt if any *Artemisia* has been found in a perfectly wild state in the southern hemisphere.

1190. (1.) Myriogyne *elatinoides. Less. in Linn.* vi. *p.* 219. *DC. Prodr.* 6. *p.* 139.—Moist places near Osormo, Prov. of Valdivia; *Bridges,* (*n.* 788.)

1191. (1.) Leptinella? *acænoides* (H. & A.); stolonifera

subvillosa, foliis spathulatis pinnatifidis segmentis ovalibus hinc vel utrinque margine inciso-dentatis inferioribus minoribus discretis superioribus majoribus arcte approximatis, involucri foliolis 5 uniserialibus margine scariosis.—Cape Horn, Staten Land; *Dr Eights.* Cape Tres Montes; *C. Darwin, Esq.*—β. *major;* minus villosa, foliis glabriusculis segmentis magis discretis, capitulis majoribus.—Fields at Chumpulla, near Valdivia; *Bridges,* (*n.* 756.)—In our specimens from Mr Bridges, there are no traces of ligulate or marginal female florets, but those of the disk are male in as far as the styles are simple, as in *Blennospermum.* Ovaries of the male flowers, obovate, compressed, glabrous, and apparently bialate.

1192. (1.) Soliva *sessilis, R. P.*—*DC. Prodr.* vi. *p.* 143.—Valparaiso; *Cuming,* (*n.* 475.); *Bridges,* (*n.* 539.) Buenos Ayres; *Dr Gillies, Tweedie.*—The wing of the achenium has, as it were, a piece cut out on each side near the base; and we are of opinion, that the *Soliva pterosperma,* Less., and DC., (*Gymnostylis, Juss.*) and the *Gymnostylis Chilensis* and *alata* of Sprengel, all belong to this species.

1193. (2.) S. *araulis* (H. & A.); Acaulis, foliis longe petiolatis pilosiusculis bipinnatisectis, segmentis anguste oblongolinearibus, acutis, capitulis sessilibus radicalibus congestis, acheniis anguste oblongis alis crassiusculis transversim rugulosis apice villosis in cornua brevissima patentia excurrentibus.—Buenos Ayres; *Tweedie.* This seems to be very closely allied to *S. Lusitanica,* Less. (*Hippia stolonifera,* Brot.) Is it not possible that this, the only species accounted European, may have been introduced by the Portuguese from Buenos Ayres? We have not seen any plant agreeing with *S. nasturtiifolia,* (Juss.) said to be from Buenos Ayres.

### Subtrib. VIII. Gnaphalieæ, Less.

1194. (1.) Helichrysum (Sect. I. Less.); *Chilense* H. & A. araneoso-lanata, caule simplici vel ad apicem solummodo corymboso polyphyllo, foliis inferioribus spathulatis obtusis superioribus sensim minoribus acutiusculis, capitulis glomera-

tis, glomerulis solitariis vel corymbosis, involucri turbinati basin attenuati squamis subæqualibus erectis imbricatis obtusis undulatis opacis sordide albis exterioribus ovatis lanatis, interioribus oblongis glabris.—About Valparaiso; *Bridges*, (who finds it on cliffs near the sea.) *Cuming*, (*n.* 63.)—The root is woody, fusiform, branching above. *Stems* ten inches to a foot long; capitula crowded, dirty yellow, or cream-coloured; not glossy, but rather opaque; each about four inches long, broad above, and tapering into the short pedicel.

### Gnaphalium, *Don. DC.*

Sect. 1. Eugnaphalium. § 1. Xanthina.

* *Foliis decurrentibus.*

1195. (1.) G. *cheiranthifolium, Lam.—DC. Prodr.* vi. *p.* 223.—Monte Video and N. Patagonia; *Tweedie*, (*n.* 1031.) Valle del Rio Tinguirica, Chili, and in the Andes of Chili; *Dr Gillies.* Valparaiso, (and probably throughout all Chili;) *Cuming*, (*n.* 446.) *Bridges*, (*n.* 279.) Juan Fernandez; *Bertero*, (*n.* 1462.) *Dr Scouler.*—β. foliis supra viridibus subtus albidis.—G. citrinum, *Hook. et Arn. in Bot. of Beech. Voy.*, *p.* 31. *DC. Prodr.* vi. *p.* 223.—Uraguay and N. Patagonia; *Tweedie.* El Aguadita, and El Morro, Prov. of San Luis; *Dr Gillies.*—May not *G. paniculatum* Colla and DC. be a var. of this species?

1196. (2.) G. *cymatoides, Kunze in Poepp. Coll. Chil. n.* 21.—*G. ulophyllum, H. & A. Bot. of Beech. Voy.*, *p.* 31.—Valparaiso; *Bridges*, (*n.* 229.) Chronos Archipelago; *C. Darwin, Esq.* (*n.* 332.)—We adopt the name of Kunze, which, according to De Candolle, was given in Poeppig's collection of dried specimens the year before our description appeared in the Botany of Beechey's Voyage. We believe that a very limited number of that dried collection was on sale, if they were on sale at all; and we have long endeavoured to obtain access to a set, but in vain. De Candolle gives *G. Piravira* of Lessing as the same as this, and he places it, though we think incorrectly, in his § Axanthina.

§ II. Axanthina, *DC.*

* *Capitulis corymboso-congestis.*

1197. (1.) G. *puberulum, DC. Prodr.* vi. *p.* 224.—Chili; *Bertero,* (*n.* 299.)—We are unacquainted with this species.

1198. (2.) G. *Vira-vira, Mol. Chil.—DC. Prodr.* vi. *p.* 324. *Less. in Linn.* 1821. *p.* 227, (*excl. var.*).—Elichrysum, *Feuill. obs.* 3. *p.* 18. *t.* 13. *f.* 2.—Playa aucta, Valparaiso; *Bridges,* (*n.* 232.) *Cuming,* (*n.* 690.)

** *Capitulis in spicam racemosam dispositis.*

1199. (3.) G. *spicatum, Lam. DC. Prodr.* vi. *p.* 233.—G. coarctatum; *Hook. et Arn. Bot. of Beech. Voy., p.* 31.—Buenos Ayres; *Tweedie.* Uspallata, Andes of Mendoza, to the Pampas of Buenos Ayres; *Dr Gillies.* Conception, Chili; *Cuming,* (*n.* 128.) Valdivia, (*n.* 643, 644.) and Valparaiso; *Bridges.* Chronos Archipelago; *C. Darwin, Esq.,* (*n.* 333.)—A very variable species assuredly: we possess specimens from six inches to a foot and a half full, and leaves from one to six inches long. We fear that *Gn. Americanum* is not distinct from this, and we believe it will be found very general on the North and South American continents. We have specimens from Peru, Columbia and Mexico, West Indies, &c., and they have a striking similarity with the *G. sylvaticum* and its varieties of Europe.

2000. (4.) G. *falcatum, Lam. De Cand. Prodr.* vi. *p.* 233. —G. Chilense; *Hook. et Arn. in Bot. of Beech. Voy., p.* 31.—G. Berteroanum, *DC.?* (who quotes our *G. Chilense* under this, as well as under *G. falcatum.*)—Conception; *Beechey, Cuming,* (*n.* 129.) Valparaiso; *Bridges,* (*n.* 231.) *Mathews,* (*n.* 278.) *Cuming,* (*n.* 364.) Mas Afuera; *Cuming,* (*n.* 1353.) Andes of Mendoza; *Dr Gillies.* Maldonado; *Dr Gillies.* Buenos Ayres; *Tweedie.* Port George, Patagonia; *King's Voyage.*—This again is sometimes difficult to be distinguished from the preceding. The glomerules of capitula are less compactly spiked; but it seems to pass into *G. spicatum,* and it is hardly possible accurately to define any of the species of De Candolle's group, " *Capitulis in spicam racemosam dispo-*

*sitis.*" Probably some of our varieties of that and the preceding species may be found to answer to the *G. stachydifolium*, Lam. and DC., and *G. Chamissonis*, DC.; the first a native of Monte Video; the second of Chili.

2001. (5.) G. *alienum*, (H. et A.); ramis sterilibus densis brevibus cæspitosis floralibus elongatis gracilibus simplicibus foliisque albo-lanatis, foliis lineari-spathulatis superioribus linearibus, capitulis in spicas terminales interruptas dispositis basi densissime lanosis, involucri cylindracei basi attenuati pulcherrime rosei squamis oblongis acutis erectis imbricatis. —Chili. *Cuming*, (*n.* 64.)—This has altogether a very peculiar aspect, something like that of our European *Xeranthemum*, and quite unlike that of any American *Gnaphalium*. Perhaps it should form a second species of *Helichrysum* of that country. The female florets are in several series in the circumference; the hermaphrodite, about six, in the centre; the receptacle is small, naked? The root is small, woody, fusiform; from its top spring many dense, short, leafy branches, 1—2 inches long, and from among them, 4—6 flowering branches, 5—6 inches high, slender, and like the whole plant, except the involucre, clothed with short, white, compact wool; at the base of the involucre the wool is loose and very copious, forming a dense white tomentose cup from which the glossy deep rose-coloured scales of the involucre arise.

2002. (1.) Filago *Gallica*, *L.—DC. Prodr.* vi. *p.* 248.—Oglifa Gallica, *Less.*—Logfia subulata, *Cass.*—Gnaphalium Gallicum, *L.*—Valparaiso; *Cuming*, (*n.* 576); *Bridges*, (*n.* 228.)

Subtrib. IX. Senecioneæ. *Less.*

2003. (1.) Balbisia *Berterii*, *DC. Prodr.* vi. *p.* 447. *Deless. ic. sel.* iv. *t.* 62.—*De Caisne in Ann. Sc. Nat. N. S.* i. *p.* 29. —Ingenhouzia thurifera, *Bert. Mst.*—Juan Fernandez; *Bertero*, (*n.* 1467); *Cuming*, (*n.* 1392. *masc.*)—The male plant has not been seen by Bertero. In it we find as follows:—Corolla ut in planta fœminea, at pappo longior. Antheræ lineares, coalitæ, inclusæ. Stylus inclusus, ramis erectis bre-

vissimis sursum dilatatis exappendiculatis obtusis parte dilatata papillosis. Ovaria inania, albida, pilosa.

2004. (1.) Robinsonia *thurifera, De Caisne in Ann. Sc. Nat. N. S.* i. *p.* 28.—*DC. Prodr.* vi. *p.* 448. *Deless. ic. sel.* iv. *t.* 63.—Senecio thurifer; *Bertero*, (*n.* 1511.)—Juan Fernandez; *Bertero; Douglas.*—Nom. Vern. *Resino macho.*

2005. (2.) R. *Gayana, De Caisne, l. c. DC. l. c. Deless. l. c. t.* 64.—Senecio thurifer, *var.?* *Bert.* (*n.* 1511.)—Juan Fernandez; *Bertero.* Nom. Vern. *Resino hembra.*

2006. (3.) R. *gracilis, De Caisne, l. c.—DC. l. c.*—Senecio stenophyllus; *Bertero*, (*n.* 1510.)—Juan Fernandez; *Bertero.* —Nom. Vern. *Resinillo.*

## SENECIO.

§ 1. Fruticosi vel suffruticosi. Sect. 1. RADIATI.

* *Folia subintegerrima, nunc rarius divisa.*

2007. (1.) S. *subulatus*, (*Don. mst.*); fruticosus ramosissimus glaber foliis lineari-subulatis mucronato-aristatis integris vel pinnatifidis, capitulis subcorymbosis, involucri latocylindracei foliolis acutis costatis vix sphacelatis basi bracteolis parvis subulatis, ligulis sub 14 linearibus disci (multiflori) diametrum vix superantibus.—*α. prostratus;* ramis numerosissimis brevibus multifloris, foliis plurimis pinnatifidis lobis paucis elongatis.—Frequent near Capiz, province of Mendoza. Nom Vern. "*Romerillo:*" *Dr Gillies.*—*β. elatior;* ramis elongatis foliis plurimis pinnatifidis lobis paucis brevibus, involucro angustiori.—El Posito, Prov. San Juan; *Dr Gillies.* —*γ. erecta;* ramis elongatis erectis, foliis plerisque indivisis siccitate nigrescentibus.—Port-Belgrave, entrance to Bahia Blanca, N. Patagonia; *Tweedie.*—*δ. macrantha;* ramis elongatis erectis, foliis longioribus siccitate nigrescentibus omnibus indivisis, capitulis majoribus.—Bahia Blanca, coast of Patagonia; *C. Darwin, Esq.*, (*n.* 351.)—A very variable plant assuredly; and we think we are correct in bringing the above several varieties under this species. Leaves 2—3 inches long, tipped with a soft mucro, fleshy, and as it were compressed, when recent.

2008. (2.) S. *vaginatus*, (H. et A.); caule erecto fruticoso? glabro subsimplici, foliis carnosis lineari-subulatis acutis erecto-patentibus glabris supra canaliculatis subtus teretibus basi dilatato-vaginatis in axillis (supremis præcipue) lanatis, capitulis paucis subcorymbosis, involucri lato-campanulati subpubescentis foliolis acutis non sphacelatis basi bracteolis paucis parvis subulatis, ligulis 14—15 oblongo-linearibus discum multiflorum subæquantibus.—Berkeley Sound, Falkland Island; *C. Darwin, Esq.*, (*n.* 362. and 376.)—A very singular species. The leaves are one and a half to two inches long, rigid, and almost black in the dry state. Involucre short in proportion to its breadth. Flowers rather large.

2009. (3.) S. *farinifer*, (H. et A.); fruticosus pubescenti-tomentosus, ramis elongatis erectis gracilibus subangulatis, superne subaphyllis, foliis lineari-subulatis mucronatis planis integerrimis uninerviis, capitulis solitariis v. corymbosis; involucri campanulati farinoso-glanduliferi foliolis acuminatis non sphacelatis basi pauci-bracteolatis, ligulis 10—12 lato-linearibus discum æquantibus.—Near Vina de la Mar, Chili; *Bridges*, (*n.* 223). Valparaiso; *Cuming*, (*n.* 583.)—This is a very peculiar plant, of which we find no description among the numerous Chilian species of *Senecio*, described by De Candolle. The branches are from six inches to a foot long. The flowers moderately large; in the older specimens more than an inch across.

2010. (4.) S. *Chilensis*, *Less.*—*DC. Prodr.* vi. *p.* 415.—Cineraria Montevidensis, *Spr.* (*fide Lehm. in Herb. Nostr.*)—S. cuspidatus, *DC. Prodr.* vi. p. 419.—Monte Video; *Tweedie.*—Maule Province; *Cuming*, (*n.* 337.)—We can perceive no difference between the specimens found on the Pacific and the Atlantic side of America.

2011. (5.) S. *phagnalodes*, *DC. Prodr.* vi. *p.* 415.—S. gummifer; *H. et A. mst.*—Conception; (*D'Urville*); *Cuming*, (*n.* 825.)—This has smaller and much more crowded leaves than *S. Chilensis*, and the flowering branches are more elongated and almost leafless. There is too in our specimens, a

viscid substance, which causes particles of fine black sand to adhere to the branches and leaves.

2012. (6.) *S. ceratophyllus*, (*Don, mst.*); suffruticosus lana arachnoidea decidua vestitus, ramis angulatis superne subaphyllis monocephalis, foliis lineari-spathulatis mucronatis planis apice tridentatis supremis nunc integerrimis, involucri campanulati foliolis subulatis basi pauci-bracteolatis non sphacelatis sub-14 lato-linearibus.—*α. major;* ramis foliisque elongatis, foliis superioribus integerrimis.—Bahia Blanca, N. Patagonia; *Tweedie*, (*n.* 40.) *C. Darwin, Esq.*, (*n.* 368).—*β. nana;* ramis brevissimis dense foliatis, foliis omnibus tridentatis carnosis. S. Chili; *Captain Reynolds.*—The capitula are alike in both these varieties; our *β* may, perhaps, form a distinct species. Our *α.* is closely allied to *S. Chilensis*, and may possibly be a state of it with trifid leaves.

2013. (7.) S. *Donianus*, (H. et A.); suffruticosus? dense albo-lanatus lana demum decidua, foliis remotiusculis subcarnosis lato-lanceolatis basi attenuatis grosse dentato-pinnatifidis, corymbis oligocephalis, involucri campanulati foliolis acuminatis, ligulis. . . .?—*S. lanuginosus*, Don, (*non Spr.*)—Summit of the Cumbre, and Paramillo de las Cuevas, Andes of Mendoza; *Dr Gillies.*—Our specimens of this plant are very imperfect; we are even doubtful if the capitula be not discoid rather than radiate, and if the stems be not herbaceous; but the leaves are very peculiar, and about an inch long.

2014. (8.) S. *Eightsii*, (H. et A.); humilis fruticosus valde ramosus, ramis brevibus erectis glabris inferne nudis cicatricatis superne dense foliosis, foliis spathulatis apice æqualiter profunde trifidis subtus deciduo-tomentosis marginibus subrevolutis laciniis linearibus obtusis, capitulis solitariis terminalibus sessilibus, involucri campanulati foliolis acutis apice nigro-sphacelatis glabris basi paucibracteolatis tomentosis, ligulis sub-12.—Staten Land, Cape Horn; *Dr Eights, n.* 39.)—A small, well marked species, 4—6 inches high, with copious, alternate, erect branches; very leafy above, bare beneath, and marked with the scars of fallen leaves. Flowers

about three-fourths of an inch across. Scales of the involucre tipped with deep black.—It cannot be the *S. trifurcatus*, DC. (*Cineraria*, Spr.), from the Straits of Magellan; for that has an herbaceous and scapiform stem.

2015. (9.) S. *Darwinii*, (H. et A.); humilis fruticosus dense albo-arachnoideo-lanatus, ramis apice subaphyllo monocephalo, foliis patentibus obovato-spathulatis coriaceis apice trifidis, involucri late campanulati foliolis acuminatis demum glabris basi pauci-bracteolatis, ligulis 12—14 lato-linearibus distincte 3-nerviis disco brevioribus.—South part of Terra del Fuego; *C. Darwin, Esq.*, (*n.* 359.)—*β. laxus;* foliis remotis basi sublonge attenuatis.—Same locality; *C. Darwin, Esq.*

2016. (10.) S. *heterotrichus, DC. Prodr.* vi. *p.* 419.—Puerto Bravo, S. Brazil; *Tweedie,* (*n.* 1353.)—This is well named and well described by De Candolle. In some specimens the toothing of the leaves is very distinct, and the teeth terminated by a black gland.

** *Foliis pinnatifidis, lobis magis minusve profundis.*

2017. (11.) S. *limbardioides*, (H. et A.); fruticosus glaber, ramis elongatis striatis copiose foliatis, foliis lanceolatis basi attenuatis subcoriaceis enerviis pinnato-lobatis lobis brevibus integerrimis acutis, corymbis terminalibus pedunculis pedicellisque gracilibus, involucri campanulati basi calyculati foliolis acutis vix sphacelatis, ligulis lato-oblongis discum multiflorum superantibus nervosis.—Sandy hills about Quintero; *Bridges*, (*n.* 393.)—*β.* foliis angustioribus lobis paucioribus nunc integerrimis.—Valparaiso; *Cuming*, (*n.* 614.)—This must, we should think, be described in De Candolle, yet we do not find that the character of any of his species corresponds with it. The leaves are two inches long, half an inch broad, narrower in *β.*, and less pinnatifid; indeed this latter is as much entitled to rank in the preceding as in the present group.

2018. (12.) S. *Berterianus, Colla.—DC. Prodr.* vi. *p.* 417.—Coquimbo; *Cuming*, (910.)—Habit of the last; but with a

glandular pubescence, longer and narrower leaves, the lobes more numerous, short, but frequently toothed, as well as the rachis, giving a ragged appearance to the margin of the leaves. Our *S. bipinnatifidus, Bot. of Beech. Voy. p.* 32, is probably not different from this.

2019. (13.) S. *alcicornis*, (H. & A.); fruticosus glaber, ramis elongatis strictis striatis superne subaphyllis, foliis lanceolatis acuminatis irregulariter laciniato-pinnatifidis laciniis elongatis lineari-acuminatis foliorum supremorum angustissimis, corymbis terminalibus 4-8-cephalis, involucri lato-campanulati foliolis acutis non sphacelatis basi bracteolis tenuibus, ligulis sub-10 latiusculis nervosis disco brevioribus.—Coquimbo; *Cuming*, (*n.* 859.)—The very ragged appearance of the leaves, from the irregular manner in which they are divided, is quite peculiar, as far as we know, to this species: the segments are much acuminated. The texture is thin, and there is an indistinct reticulated venation. Yet there is a good deal of similarity of habit in this and the two preceding species.

2020. (14.) S. *barbatus*, (Don. mst.); humilis fruticosus dichotome ramosus, ramis pedunculis foliis axillisque præcipue laxa densissima laxa demum decidua vestitis, foliis brevibus coriaceo-carnosis acutis bipinnato-lobatis subtus canaliculatis, lobis brevibus acutis rachibusque lato-linearibus, capitulo solitario terminali, involucri campanulati foliolis paucis (sub-10) acutis margine diaphanis basi calyculatis lanatis non sphacelatis, ligulis 10 brevibus ovali-oblongis.—Ascent of El Alto de los Manantiales, Andes of Mendoza; *Dr Gillies.*—A very singular looking, tortuous, little, shrubby plant; so woolly, especially in the axils of the leaves, that the branches look like those of some of the South American woolly *Talina.* Leaves short, scarcely half-an-inch long, rigid, pungent. Leaflets of the involucre singularly pale, and diaphanous at the margins.

2021. (15.) S. *glandulosus*, (Don. mst.); fruticosus pubescenti-glandulosus, foliis remotiusculis lineari-lanceolatis acutis pinnato-lobatis marginibus reflexis, lobis paucis brevibus acutis, capitulis terminalibus solitariis vel 2-4 subcorymbosis,

involucri campanulati foliolis acutis glandulosis basi calyculatis, ligulis . . . . ?—Andes of Mendoza; *Dr Gillies.*—Base of the plant quite woody; the flowering branches, except at the base, herbaceous and pubescenti-glandular. Our specimens are not very perfect; but we know of nothing which will accord with it.

2022. (16.) S. *Bridgesii, H. & A. in Bot. of Beech. Voy., p.* 57. *DC. Prodr.* vi. *p.* 416.—Valparaiso, to the Andes of Chili; *Bridges; Cuming,* (*n.* 65); *Dr Gillies.*—Readily distinguished from all in this section, by its comparatively small, narrow, cylindrical involucres, its very compound corymbs of copious capitula, and from the following of the section; moreover, by the plane (not thick or fleshy) and one-nerved leaves.

2023. (17.) S. *Uspallatensis,* (H. & A.); fruticosus glaber, ramis numerosis brevibus usque ad apicem foliosis, foliis coriaceo-carnosis canaliculatis bipinnatifidis rachide lobisque linearibus acutis brevibus simplicibus vel divisis, corymbis in ramis brevibus terminalibus oligocephalis, involucri glabri cylindracei foliolis acutis non sphacelatis, ligulis sub-10 brevissimis.—Uspallata, Andes of Mendoza; *Mr Cruikshanks.*—β. *tenuior;* foliis ramisque tenuioribus.—Andes of Mendoza; *Dr Gillies.*—γ. *retroflexus;* foliis bipinnatifidis lobis recurvatis.—Frequent on Paramillo, Andes of Mendoza, where it is called *Pachochomo*, and where an infusion is drunk by the miners instead of Mate; *Dr Gillies.*—This is a very woody-looking plant, even nearly to the extremity of the smaller branches; but the capitula have a great resemblance to those of the following, and the leaves are so variable on others of this genus, that we know not where to draw the limits of the species.

2024. (18.) S. *pinnatus, Poir.*—*DC. Prodr.* vi. *p.* 419.—S. Megapotamicus, *Spr.?*—Pampas of Buenos Ayres, and lower margin of the Jarillal above Mendoza; *Dr Gillies.* Banda Orientale; *Tweedie.* St Julian and Bahia Blanca, N. Patagonia; *C. Darwin, Esq.,* (*n.* 392. and *n.* 396.) N. Patagonia; *Tweedie.*—We have copious specimens of this plant from various localities on the Atlantic side of extratropical South

America, and from the Andes of Mendoza; but we hardly see how it is to be distinguished from the *S. haheæfolius* on the Pacific side. In our specimen, the lobes of the leaf are more usually entire than in the following species.

2025. (19.) S. *Haheæfolius, Bert. Herb.—DC. Prodr.* vi. *p.* 416.—Valparaiso; *Bridges,* (*n.* 387); *Cuming,* (*n.* 695.)—β. ***viscidus;*** caule superne viscoso, foliorum laciniis compositis. —S. glaber, *Less. in Linnæa,* 1831. *p.* 248. *DC. Prodr.* vi. *p.* 416.—*S. viscosissimus, Colla? DC. Prodr.* vi. *p.* 416. —Valparaiso; *Cuming,* (*n.* 360.) Quintero and Collina, Chili; *Bridges,* (*n.* 390.)—γ. *adenophyllus;* foliis ramisque junioribus glanduloso-viscosis.—Sierra Bella vista Aconcagua; *Bridges,* (*n.* 389); Cordillera of Chili; *Cuming,* (*n.* 281.)—The *S. Haheæfolius,* to which De Candolle attributes quite entire lobes to the leaves, in our specimens, passes gradually into those states with variously compound leaves; indeed entire leaves, and pinnatifid, and bipinnatifid, may often be seen on one and the same plant: we doubt if the viscid character of the branches (by no means constant,) can be considered a distinctive character or even the glands in our var. γ.

2026. (20.) S. *bahioides,* (H. & A.); fruticosus ramis crassiusculis teretibus striatis, foliis sessilibus pinnatifidis latolinearibus laciniis longiusculis dentato-pinnatifidis, corymbis compositis, capitulis majusculis, involucri lato-campanulati foliolis acutis non sphacelatis basi calyculatis, ligulis sub-10 latis ovalibus nervosis disco longioribus.—α. *lanosus;* caule foliis involucrisque magis minusve lanatis, foliorum laciniis acutis. —Valparaiso; *Cuming,* (*n.* 616.)—β. *glaber;* foliorum laciniis obtusiusculis.—Renam et Quintero, Chili; *Bridges,* (*n.* 388.)—This is a stouter plant than most of the preceding, with much larger flowers, an inch and a-half across, and peculiarly large ray in proportion to the disk, which, nevertheless, is, like the involucre, broad also.

2027. (21.) S. *glabratus, H. & A. Bot. of Beech. Voy. p.* 32.—*DC. Prodr.* vi. *p.* 417.—S. auriculatus; *Poepp.*—S. Valparadisaicus; *Colla,* (*fide DC.*)—Valparaiso; *Bridges,* (*n.* 385); *Cuming,* (*n.* 598.)

### Sect. II. Herbacei.

2028. (22.) S. *pulcher*, (H. & A.); simplex vel ramosus arachnoideo-tomentosus lana decidua, foliis oblongo-lanceolatis crenato-dentatis radicalibus æquilonge petiolatis caulinis remotis sessilibus superioribus semiamplexicaulibus paululumque decurrentibus, capitulis magnis corymbosis involucri latissime campanulati subhæmisphærici foliolis calyculatis non sphacelatis pubescenti-lanatis obtusis, ligulis sub-20 latis (purpureis) disco longioribus.—Moist places at the foot of the Sugar-loaf mountain, near Maldonado, and at Aldoa, west of Portalegre, S. Brazil; *Tweedie*, (*n*. 1071, 1072.) This is a splendid plant, from one to three or four feet high, with flowers two inches and more in diameter, the ray purple.

2029. (23.) S. *Brunonianus*, (H. & A.); annuus albo-pubescenti-tomentosus ramosus, ramis striatis, foliis inferioribus lanceolato-spathulatis integris reliquis lineari-lanceolatis obtusis pinnatifidis lobis brevibus inæqualibus, corymbis foliosis, involucri campanulati glabri bracteolis minutis calyculati foliolis acuminatis sphacelatis, ligulis lato-linearibus sub-12 disco longioribus.—Coquimbo; *Cuming*, (*n*. 898.)—This has a small annual tap-root, throwing up three or four stems, which are a span to a foot high, and dichotomously branched every where, as well as the leaves hoary with whitish tomentum, more lax and arachnoid on the branches, and terminated by many yellow flowers, an inch and a half in diameter.

2030. (24.) S. *adenotrichius*, (*DC. Prod*. vi. *p*. 416?); elatus totus hirsuto-vel pubescenti-glandulosus, caule striato, foliis sessilibus pinnatifidis ac inciso-lobatis segmentis acutis, corymbis amplis polycephalis foliosis, capitulis magnis, involucri calyculati late campanulati foliolis acutis exterioribus subulatis laxis interiora subæquantibus, ligulis numerosis angustis vix discum æquantibus.—Chili, near Quillota; *Bridges*, (*n*.391.) Andes of Chili; *Cuming*, (*n*. 168.)—A very tall growing plant, with thick, herbaceous, striated, or almost angular stems, and numerous copiously leafy branches. Leaves three,

four, or five inches long. Flowers yellow, an inch and a-half in diameter. Our specimens have no great resemblance to the figure of De Candolle's plant, given in the *Bot. Reg. t.* 1190, under the name of *Adenotrichia amplexicaulis;* but as that represents it in a state of cultivation, they may prove the same.

2031. (25.) S. *sinuatilobus, DC. Prodr.* vi. *p.* 417.—S. mollis; *Poepp.* (*non Willd.*)—Valparaiso; *Cuming,* (*n.* 610.) Concon and Colmo; *Bridges,* (*n.* 392.)—This plant so entirely agrees with the description of *S. sinuatilobus,* that we hardly doubt it being the same, though our specimens are certainly herbaceous.

2032. (26.) S. *Cumingii,* (H. & A.); elatus, caule hirsuto-glanduloso, ramis sparse pubescenti-glandulosis, foliis (amplis) late ovatis obtusis pinnatifidis sinuato-lobatisque, inferioribus petiolatis petiolis lato-alatis basi auriculato-amplexicaulibus, intermediis sessilibus lato-auriculatis, supremis acuminatis dentatis, corymbis terminalibus subaphyllis, pedicellis elongatis superne incrassatis, involucro lato-campanulato non sphacelato hirto-glanduloso, ligulis latis discum subæquantibus. Valparaiso; *Cuming,* (*n.* 329.)—Leaves large, two and three inches broad. Flowers large, with broad ligules. Involucre and pedicels very glandular, the latter with several subulate bracteas.

2033. (27.) S. *Saltensis,* (H. & A.); totus pubescenti-glandulosus, caule dichotomo, ramis patentibus, foliis lineari-lanceolatis acuminatis dentato-pinnatifidis basi auriculatis semiamplexicaulibus summis integris, corymbo patente, involucri campanulati calyculati foliolis sub-20, ligulis sub-10 latiusculis discum æquantibus.—Salto, near Tucuman; *Tweedie.*—Flowers about an inch across. The ray seems to be reflexed, and even when dry, of a bright deep lemon-colour. Flowers about an inch across.

2034. (28.) S. *doroniciflora,* (H. & A.); totus hirsuto-glandulosus gummifer, ramis flexuosis angulatis, foliis inferioribus . . . . . ? superioribus lineari-oblongis acutis inæqualiter grosse serrato-dentatis basi latioribus semiamplectantibus,

corymbis oligocephalis parce foliosis, capitulis maximis, involucri lato-campanulati calyculati foliolis sub-20 acuminatis, ligulis sub-20 latiusculis discum æquantibus.—Banda Orientale; *Tweedie.*—Mr Tweedie notes upon this, that it is a strongly scented gummy biennial. Our specimen is evidently only an upper branch. This is every-where, as well as the involucre, thickly clothed with viscid, patent, glandular hairs. The flowers are very large, nearly three inches in diameter; the ligules deep yellow.

2035. (29.) S. *nigrescens, H. & A. Bot. of Beech. Voy. p.* 32. *DC. Prodr.* vi. *p.* 415.—S. chamædryfolius; *Less.*—Nilgue; *Feuill. Chil.* 2. *t.* 44.—South Chili; Conception; *Beechey; Macrae; Cuming,* (*n.* 799.)—St Mary, South Pacific Ocean; *Dr Eights,* (*n.* 81.)

2036. (30.) S. *denticulatus, DC. Prodr.* vi. *p.* 416.—Cineraria denticulata, *H. & A. Bot. of Beech. Voy. p.* 29.—Cineraria Americana; *Linn. Suppl.,* (*fide DC.*)—Danaa Yegua; *Colla. Art. Turin.* 38. *p.* 29. *t.* 28.—Conception; *Beechey; Macrae.* Valparaiso; *Cuming,* (*n.* 336.) Banks of the river of Valdivia and in woods; *Bridges,* (*n.* 596.) South Chili; *Capt. Reynolds,* (*n.* 39, 107.)—Six to twelve feet high, with copious corymbs or panicles of flowers; but the flowers are small in proportion to the size of the plant: leaves of the involucre few, (6-7) and the ligules only three or four, very small. We had thought this a shrubby plant, but on a more careful inspection, our specimens appear to be truly herbaceous, like the following, which is a nearly allied, though totally distinct species.

2037. (31.) S. *otites, Kunze in Poepp. Coll. Pl. Chil.* iii. *p.* 190.—*DC. Prodr.* vi. *p.* 416.—S. hastæfolius, *H. & A. mst.*—Andes of Antuco; *Poeppig.* Banks of the river, and in the woods of Valdivia; *Bridges,* (595). Chiloe; *Cuming,* (*n.* 59.) Araucania; *Capt. Reynolds,* (*n.* 37.)—Six to eight feet high, according to Mr Bridges. The leaves vary much in breadth; from one to four inches in some specimens.

2038. (32.) S. *Tweediei,* (H. & A.); elatus glaberrimus, caule striato, foliis radicalibus longe petiolatis elliptico-obo-

vatis integerrimis caulinis lineari-oblongis sessilibus acutis vel acuminatis longe remote dentatis, corymbi pedicellis elongatis parce bracteatis, capitulis magnis, involucri late cylindraceo-campanulati calyculati foliolis 18-20 acuminatis non sphacelatis, ligulis latiusculis discum superantibus.—Ditch-sides of Buenos Ayres; *Tweedie.*—Flowers large. Involucre perfectly glabrous.

2039. (33.) S. *Hualtata, Bert. in DC. Prodr.* vi. *p.* 417. —Cineraria gualtata; *Gill. mst.*—S. fistulosus; *Poepp. DC. Prodr.* vi. *p.* 418, (*an etiam S. Dombeyanus, DC.*?)—Rancagua and Quintero; *Poeppig.* Frequent among standing water in the Cienegas of Totoral and Capis, Mendoza; *Dr Gillies.* Marshes, Quillota; *Bridges,* (*n.* 490.) Valparaiso; *Cuming,* (*n.* 348.)

2040. (34.) S. *ochroleucus,* (H. & A.); elatus arachnoideus demum glaber, caule erecto striato, foliis radicalibus oblongo-ellipticis crenato-dentatis longissime petiolatis, caulinis remotis lanceolatis longe inæqualiter dentatis superioribus sensim minoribus sessilibus acuminatis, corymbo composito polycephalo, involucri campanulati calyculati foliolis subdecem acuminatis striatis, ligulis latis discum superantibus.—Marshy places, province of Valdivia; *Bridges,* (*n.* 587.)—*β.* corymbo simplici.—Buenos Ayres; *Tweedie.*—A very fine new species, two to four feet high. Radical leaves a span long, and thin petioles still longer. Corymbs large or long, almost naked stalks, which are again divided. Involucre with rather broad acuminated leaflets, nearly black when dry. We do not find any specific difference between the plant of Tweedie from Buenos Ayres, and that from Valdivia.

2041. (35.) S. *Bonariensis,* (H. & A.); erectus glaberrimus simplex, caule striato fistuloso parce folioso, foliis oblongo-lanceolatis obtusiusculis subdentatis, radicalibus longe petiolatis petiolo basi dilatato, caulinis sessilibus basi latis subsagittatis, corymbo denso, pedicellis bracteatis, involucri calyculati foliolis sub-14 acutis lanceolatis subsphacelatis, ligulis sub-12 latis disco brevioribus subenerviis.—Buenos Ayres; *Tweedie.*—Scarcely a foot high. Leaves three, four, and five inches long, the radical ones on stalks equal to the

blade in length, upper ones gradually smaller, bracteiform. Flowers scarcely an inch across, pale yellow, almost cream-coloured, opaque, so that the nerves are scarcely visible.

2042. (36.) S. *canabinæfolius*, (H. & A.); glaberrimus, ramis flexuosis striatis, foliis profunde bi-tripinnatifidis vel rarius pinnatim sectis laciniis paucis lineari-lanceolatis acuminatis serratis, corymbis compositis aphyllis parce bracteatis, involucri ovato-cylindracei calyculati foliolis sub-20 acutis non sphacelatis, ligulis 8-10 latiusculis disco brevioribus.—Marshes of La Plata, near Buènos Ayres; *Tweedie.*—β. foliorum laciniis 4-6 angustioribus subtus inter marginem et costam tomentosis.—Banda Orientale; *Tweedie.*—The leaves of this plant are very peculiar, generally of about three inches long, unequal, narrow acuminated laciniæ. Our *var.* β. may prove a distinct species, but evidently allied to this.

2043. (37.) S. *crassiflorus, DC. Prodr.* vi. *p.* 412.—Cineraria crassiflora; *Lam. Ill. t.* 675. *f.* 4.—C. vestita; *Spreng.*—On the sandy shores of the Uraguay, " creeping among the sand to a great width," and on a quicksand on the Arroy de Los Vagues, Banda Orientale; *Tweedie*, (*n.* 887, and 888.)—This is a very handsome species, every part densely hoary with white tomentum, except the large bright yellow corollas. Flowers solitary, or two together.

2044. (38.) S. *arnicoides, H. & A. Bot. of Beech. Voy. p.* 32.—S. plantagineus; *Bert. in Colla, Mem. Acad. Turin.* xxxviii. *p.* 32.—Aster plantagineus, " *Poepp. Pl. exsicc.* (*n.* 265.)"—Chili; *Bridges.* Conception; *Beechey.* Valparaiso; *Matthews*, (*n.* 243.) *Cuming*, (*n.* 516.)

2045. (39.) S. *trifurcatus, Less.—DC. Prodr.* vi. *p.* 435.—Cineraria trifurcata: *Spr.*—Woollaston Island, Cape Horn; *C. Darwin, Esq.*, (*n.* 381.)—A small plant, five inches to a span high, with a perennial root of long thick descending fibres. Stem scapiform, but leafy, with a solitary capitulum. Radical leaves several, spathulate, somewhat fleshy, 3-5 lobed at the apex, lobes ovate obtuse, with a somewhat callous point; the base is dilated, and sheathing. Cauline leaves linear-subulate, with a membraneous almost sheathing base. This seems

to answer to the *Cineraria trifurcata*, Spr., as far as the lower leaves are concerned, and it is from pretty near the same locality. We may observe, however, that the structure of the stem-leaves is very similar to that of our *S. vaginatus.* The flower is about an inch across. Involucre campanulate, scarcely calyculate, not sphacelate, of about 10-12 sharp glabrous leaflets, and with about as many yellow ligules.

2046. (40.) S. *zosteræfolius*, glaberrimus parvus annuus, radice fibrosa, caule scapiformi simplici folioso gracili monocephalo, foliis radicalibus linearibus obtusissimis enervibus basi dilatatis diaphanis subvaginantibus, caulinis sensim brevioribus subulatis, involucro lato-campanulati ecalyculati foliolis sub-14 acutis non sphacelatis, ligulis totidem brevibus obtusis estriatis integerrimis.—Margins of the Laguna de Ranco, near Valdivia; *Bridges*, (*n.* 632.)—This is a very remarkable looking plant, and has all the appearance of being an aquatic; the texture of the leaves is very similar to that of *Zostera*. Flower about three-fourths of an inch across, probably yellow where recent, but greenish where dry.

### Sect. III. Discoidei.

#### * *Tomentosi.*

2047. (41.) S. *depressus*, (H. et A.); nanus cæspitosus subacaulis totus dense cano-tomentosus, foliis imbricatis oblongis acutis integris vel apice tridentatis, capitulo terminali solitario, involucri lanati ecalyculati? foliolis numerosis (sub-24) subulatis apice sphacelatis, corollis pappo immersis, —Culcitium depressum, *Don, mst.*—Summit of Planchon and Valle de los Ciegos, Andes of Mendoza; *Dr Gillies.*—Our plants are scarcely three inches high. Leaves three-fourths of an inch long, dense, and imbricated; some entire, others 3-toothed at the apex.

2048. (42.) S. *Poeppigii*, (H. et A.); humilis cæspitosus multiceps ubique dense cano-tomentosus, caulibus basi foliosis apice pedunculiformibus monocephalis, foliis oblongis subspathulatis obtusis puncto nigro terminatis laxe imbricatis integerrimis margine subrevolutis, pedunculo bracteato, invo-

lucri campanulati basi acuti calyculati foliolis 16 dense tomentosis subulatis apicibus nudis nigro-sphacelatis.—Cineraria; *Poepp.*—Senecio micropifolius, β. monocephalus, *DC. Prodr.* vi. *p.* 413.—Culcitium candidum, *Don, mst.*—Cerro de la Polcura; Andes of Mendoza; *Dr Gillies.*—Root somewhat fusiform, woody. Stems severed from the summit of the root, 4—6 inches high, clothed in the lower half with leaves an inch long, above, naked and pedunculiform, bearing a solitary capitulum and a few linear bracteas. Corollas numerous, about as long as the involucre and the pappus. It seems to be the *S. micropifolius, β. monocephalus* of De Candolle.

2049. (43.) S. *Magellanicus*, (H. et A.); herbaceus sericeo-tomentosus, caule erecto scapiformi monocephalo foliis radicalibus lineari-lanceolatis acuminatis inferne attenuatis basi longissime lateque membranaceo-vaginantibus, caulinis remotis linearibus, involucri lato-campanulati calyculati foliolis sub-20 dense sericeo-tomentosis lineari-lanceolatis apicibus sphacelatis.—Cape Negro, Straits of Magellan; *C. Darwin, Esq.*, (*n.* 367). Port Famine, Patagonia; *Capt. King's Voyage.*—This, and the two preceding, have a good deal the appearance of *Culcitia.* The present one is about a foot high, with long narrow radical leaves which have singularly long sheathing bases, and a scapiform stem. Capitulum about an inch in diameter.

2050. (44.) S. *Gilliesii*, (H. et A.); canescens arachnoideo-lanatus lana demum decidua caule paucifolio scapiformi mono-dicephalo, foliis radicalibus ovali-oblongis crasso-carnosis dentatis in petiolum longum attenuatis caulinis sessilibus superioribus linearibus; capitulis magnis, involucri lato-campanulati calyculati foliolis sub-30 lineari-acuminatis vix sphacelatis.—Culcitium dentatum, *Don, mst.*—Valle del Rio Atuel and Cerro de la Polcura; *Dr Gillies.*—A fine and very distinct species, with a fusiform root and rather stout, herbaceous and apparently succulent scapiform stem, ten inches high. Leaves thick and fleshy; radical ones numerous, including the flattened petiole, cauline ones small, distant. Capitula an inch and a half across. The whole plant appears

in a young state to have been covered with a cobwebby wool, and on its falling away, the plant has the peculiar hoary tint which is seen on many species of *Atriplex*, and other marine plants, yet there is no appearance of tomentum or of scales or any mealy covering.

2051. (45.) S. *fasciculatus*, (H. et A.); fruticosus subdichotome ramosus albo-tomentosus, foliis remotiusculis linearibus obtusis carnosis marginibus revolutis, axillis fasciculos foliorum vel ramos breves folios gerentibus, capitulo terminali solitario, involucri ecalyculati foliolis sub-18 subulatis apice subsphacelatis, acheniis elongatis glaberrimis pappi longitudine.—Valparaiso; *Cuming*, (without No.)—A solitary specimen of this was in Mr Cuming's Herbarium from Valparaiso, and in an imperfect state. It seems, however, a very distinct and well-marked species.

2052. (46.) S. *albicaulis*, (H. et A.); fruticosus incano-tomentosus demum nudiusculus, ramis albidis lævissimis, foliis linearibus obtusis subcarnosis marginibus subcarnosis integerrimis vel rarius pinnatifidis, corymbis compositis, involucri cylindraceo-campanulati corollis brevioris foliolis sub-14 linearibus acutis apice subsphacelatis.—*α. Gilliesii;* foliis integerrimis incanis.—Mountains of Villavicenzia, above Mendoza; "odour of honey," *Dr Gillies.*—*β. subglaber;* foliis integerrimis nudiusculis.—East coast of Patagonia; *Dr Eights*, (*n.* 50.)—*γ. lobulatus;* foliis subpinnatifidis, lobis 1—2-brevibus.—Santa Cruz (Patagonia?) and Port Desire; *C. Darwin, Esq.*, (*n.* 380 and 398.)—*δ. pinnatifidus;* foliis pinnatifidis laciniis linearibus elongatis.—With *α. Dr Gillies.* Los Loamos, N. Patagonia; *Tweedie.*—Like many other of the Senecios, this is very variable in the form of the leaves, pinnatifid or entire, though usually the latter. Capitula elongated, twice as long as broad. Involucre tapering at the base, always shorter than the corollas.

2053. (47.) S. *Patagonicus*, (H. et A.); fruticosus arachnoideo-tomentosus lana magis minusve decidua, foliis lineari-oblongis acutiusculis marginibus revolutis integerrimis supra canaliculatis, corymbis oligocephalis, involucri lato-campanu-

lati calyculati foliolis oblongis acuminatis (atro-fuscis) corollis brevioribus.—Port Famine, Patagonia; *Captain King's Voyage*.—Leaves 1—3 inches long. Branches and under-side of the leaves and peduncles, white with dense wool; involucre and upper side of the leaves frequently almost naked. Involucre broader than long.

2054. (48.) S. *caricifolius*, (H. et A.); fruticosus junior (ut videtur) albo-tomentosus demum glaber, ramis fasciculatis elongatis, foliis lineari-subulatis acutis integerrimis margine revolutis, corymbis compactis capitatis, involucri cylindracei fusci calyculati foliolis 10—12 anguste linearibus nitidis exphacelatis.—Bahia Blanca, coast of Patagonia; *C. Darwin, Esq.*, (*n.* 366).—Leaves crowded, less so towards the flowers. Involucres about the size of those of *Senecio vulgaris*.

2055. (49.) S. *Candolleanum*, (H. et A.); fruticosus totus albo-tomentosus velutinus, foliis petiolatis (petiolo plano) circumscriptione latissime ovatis profunde pinnatifidis laciniis 6—7 lato-linearibus patentibus acutiusculis tenui-costatis, corymbis dense oligocephalis subcapitatis, involucri densissime lanati late campanulati calyculati foliolis sub-18 obtusis corollis brevioribus.—Coast of Patagonia; *C. Darwin, Esq.; Tweedie*.—A very distinct species, with leaves like some coarse *Artemisia*, and flowers three-fourths of an inch across, and with a short bell-shaped densely woolly involucre.

** *Glaberrimi*.

2056. (50.) S. *leptophyllus*, (H. et A.); herbaceus, ramis erectis angulato-striatis glaberrimis, foliis linearibus profunde pinnatifidis laciniis elongatis anguste lineari-subulatis planis flexuosis, corymbis laxis, pedicellis elongatis nudis, involucri laxi ecalyculati foliolis lineari-lanceolatis margine scariosis corollis brevioribus.—Valparaiso; *Cuming*, (*n.* 582.)—Stems about a foot high, the lower part of the stem appears almost woody; the upper part of the branches and flower-stalks are peculiarly slender. The capitula broader than long, almost three-fourths of an inch across.

2057. (51.) S. *linearilobus*, (H. et A.); herbaceus, ramis angulato-striatis, foliis linearibus profunde pinnatifidis laciniis remotis lineari-elongatis acutis flexuosis, corymbis polycephalis, involucri hemisphærico-campanulati ecalyculati foliolis lanceolatis acutis striatis apice sphacelatis corollis brevioribus.—Buenos Ayres; *Tweedie.*—β. foliis capitulisque majoribus, Chili; *Mr Cruikshanks.*—Leaves 2—3 inches long, the laciniæ 1½ inch long. Leaves and involucres a good deal resembling those of the preceding *C. leptophyllus;* but the lobes of the former are not at all subulate, and the scales of the latter are much broader. In our var. β. the leaves and capitules are larger.

2058. (52.) S. *chrysocomoides*, (H. et A.); fruticosus glaberrimus, ramis fasciculatis, foliis linearibus rectis profunde pinnatifidis laciniis anguste linearibus paucis (2—4) brevibus rectis, corymbis oligocephalis (capitulis 2—5) bracteatis (bracteis acerosis), involucri ovati basi acuti longe calyculati foliis subdecem laxis subulatis corollis brevioribus.—East coast of Patagonia; *Dr Eights, (n.* 54.)—Apparently a small and very distinct plant. Branches fascicled, a span high. Capitula, broadest upward, about one-fourth of an inch in diameter.

2059. (53.) S. *vulgaris*, L.—*Gaudin. in Ann. Sc. Nat.* v. *p.* 104.—Berkeley Sound; Falkland islands; *C. Darwin, Esq.*, (*n.* 364.)—Probably introduced by means of European vessels.

2060. (54.) S. *trifidus*, (H. et A.); fruticosus nanus glaberrimus, ramis brevibus crassis tortuosis, foliis carnosis linearibus apice trifidis supra canaliculatis segmentis obtusis, capitulo terminali solitario subsessili, involucro . . . . ?—Summits of the Andes of Mendoza; *Dr Gillies.*—A small woody species with thick wool, and short crooked branches scarcely rising above the surface of the soil and densely covered with fleshy leaves half an inch long, and about half a line wide. The capitula are too imperfect for description, but we believe the plant is certainly of this genus.

2061. (55.) S. *tricuspidatus*, (H. et A.); fruticosus glaber-

rimus ramis striatis foliosis, foliis linearibus planis costatis superne latioribus trifidis marginibus revolutis laciniis cuspidato-acuminatis, pedunculis bracteatis terminalibus simplicibus monocephalis vel divisis dicephalis, involucri ovati calyculati foliolis sub-18 angustis acutis apice sphacelatis corollis brevioribus.—Santa Cruz (Patagonia?) *C. Darwin, Esq.*, (*n.* 386.)—Leaves rather crowded, especially towards the upper part of the branches where the flower-stalks arise.

2062. (56.) S. *crithmoides*, (H. et A.); glaberrimus humilis, ramis brevibus fasciculatis basi suffruticosis superne pedunculiformibus bracteatis monocephalis, foliis carnosis spathulatis seu obovatis petiolatis integris dentatis 3—5-fidisve laciniis acutis, involucri lato-campanulati calyculati foliis lineari-oblongis acuminatis laxis vix sphacelatis corollis parum brevioribus.—Andes of Mendoza; *Dr Gillies.*—Extremely variable in the leaves, yet there is a peculiar habit by which it may be recognised. Leaves, an inch or more long, some linear-spathulate and entire, some ovato-spathulate and more or less toothed or 3—5-fid. Capitula, an inch in diameter.

2063. (57.) S. *limbardioides*, (H. et A.); glaber fruticosus, ramis strictis striatis subdense foliosis, foliis lato-linearibus subspathulatisve acutis planis subtus costa distincta integerrimis, corymbo polycephalo, pedicellis bracteatis (bracteis subulatis); involucri lato-campanulati calyculati foliolis sub-16 lineari-subulatis non sphacelatis corollis brevioribus.—Port-Gregory, Patagonia; *King's Voyage.*—β. *major;* foliis capitulisque paullo majoribus pedicellis bracteis numerosis.—Port-Famine, Patagonia; *C. Darwin, Esq.*, (*n.* 388.)—Leaves, 1½—2 inches long, three lines wide. Capitula, three-fourths of an inch across.

2064. (58.) S. *bracteolatus*, (H. et A.); fruticosus glaber, foliis linearibus acutis planis integerrimis, corymbis densis polycephalis, pedicellis multibracteolatis bracteolis parvis subulatis apice glandula albida, involucri ovati basi attenuati calyculati foliolis sub-10 lanceolatis acutis subsphacelatis corollis brevioribus.—Buenos Ayres; *Dr Gillies.*—Leaves

about an inch long. Capitula, longer than broad, numerous, crowded, each about half an inch across. The most striking feature of this species is in the numerous bracteolæ of the pedicels, each tipped with a minute white callous point or gland.

2065. (1.) Werneria *pygmæa*, (Gill. mst.); radice præmorsa, caule subnullo, foliis linearibus opacis obtusis basi dilatatis in axillis dense tomentosis, capitulo sessili, involucri glabri foliolis sub-14 lanceolatis acutiusculis.—Valle de los Ciegos, Andes of Mendoza; *Dr Gillies*.—This has quite the habit of *W. pumila*, H. B. K.; but in that the leaves are rigid and glossy, and there is no wool in the axils.

2066. (1.) Erechthites *hieracifolia, Raf. in DC. Prodr.* vi. *p.* 294.—E. præalta, *Less.*—Senecio hieracifolius, *L.*—Sonchus agrestis, *Sw.*—South Brazil; *Tweedie.*

2067. (2.) E. *valerianæfolia, DC. Prodr.* vi. *p.* 295.—Senecio valerianæfolius, *Wulf.—Reichenb. Ic. Exot.* i. *p.* 59. *t.* 85. —Crassocephalum valerianæfolium, *Less.*—" Senecio," *Salzman, Herb. Bahiæ.*—Shores of the Parama; *Tweedie*, (*n.* 1095.)—Pappus, of a beautiful purple colour. Leaves resembling those of *Valeriana officinalis.*

(*To be continued.*)

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## XXIV.—BOTANICAL INFORMATION.

### *Latest Intelligence from Mr Gardner.*

RIO DE JANEIRO, *Nov.* 18*th*, 1840.

MY DEAR SIR,—It gives me much pleasure to be able to inform you of my safe arrival at this place, with all the collections which I have been making since July of 1839. I remained in Minas Geraës till the beginning of October, and I arrived here on the first of this month. My headquarters in Minas, was Morro Velho, and from it I made several excursions, one of which was to the top of the Serra de Pudado, which is the highest in Minas, and notwithstanding that my journey was made at the very worst season, I found some

fine plants. On the way down, I also added largely to my stock of dried specimens: among them I may mention an *Equisetum* in fructification, *fifteen feet high*. You cannot imagine how satisfied I feel in having accomplished the long, hazardous, and fatiguing, but very interesting journey, which from fortunate circumstances, I was obliged to undertake. By a rough calculation from my journal, I find that I have gone over upwards of four thousand miles; and during the whole time I have been engaged in doing so, I may say that I have not had a single day's illness, which surprises every one as well as myself, seeing that I have passed through the most unhealthy tracts in Brazil. Much of my good health I ascribe to my rigid temperance both in eating and drinking. Since my arrival here, I have experienced much kindness from my former Rio friends, particularly from those in Harrison's house; in fact I lived with them till I procured my present quarters, which I took possession of only a few days ago. Knowing from experience that a boarding-house is very expensive to live in, and besides is not well suited for carrying on my operations, I determined to hire a small house for myself; and, in the immediate vicinity of the city, I have found one every way suited to my purpose. I have furnished it economically, and my black servant, who has now been with me a long time, being a handy fellow, I find that we will get on very well. It was only yesterday that I could begin to unpack some of my collections. The Piauhy ones I have of course opened first; and notwithstanding the several partial duckings which they have had, and the knocking about they unavoidably received on such a long journey, and in hide-boxes too, they are in a much better state of preservation than I could have anticipated. I am just now turning them all carefully over, putting them into other paper, and arranging them into their natural orders. I expect by the end of next week to be able to despatch a box to Pamplin, containing those from Piauhy and the district of the Rio Plata, perhaps about five hundred species. The labour of getting my collections put into order to send home, will

not be light, as there is scarcely a bundle among them which at one period or another has not been damaged. I fully expect, however, to be able to have them all on their way home by the end of January. The few living plants which I have brought along with me, I am just packing to be sent by the first ship for London. They will be sent to the care of Mr Pamplin. The seeds, of which I have a splendid collection, I intend to enclose in the box of dried specimens. This is a bad season to send them, but some of them are now more than a year old. I have not yet drawn upon you for money, but Harrison's people are supplying me with what I want. In the course of a month or so I shall do so for £200. From the Messrs Harrison, I have already received that amount, the greater part of which has been expended in defraying the expenses of the latter part of my journey. The death of my horses has been a great drawback to me. By the loss of them more than £100 has been added to the expenses of the journey, as mule hire in Minas is very high. Notwithstanding this, the expenses of the journey, considering its magnitude, have been made for much less than could have been anticipated. Indeed, but for what I gained and saved by my medical practice, I should have been starved out more than a year ago. The fine collections I have made, if they reach England in safety, will, I trust, more than cover the outlay. I have been anxiously expecting to hear from you ever since I arrived here, as I have received no letters from any of my Glasgow friends, since I wrote you from Morro Velho in Minas Geraës. A vessel from Liverpool is expected every day, and by her I fully expect letters. I hope they will bring me better accounts of the health of your family, than your last did. I am anxious to hear how the Glasgow meeting went off. Be so kind as to let my relations know that I am well, and with kindest regards to all my friends, believe me always to be,

My Dear Sir,

Your most obedt. Servant,

George Gardner.

## *Further Notes on the* BANYAN TREE.

AT the time the account given at p. 288 of this Journal was printing, we had not access to Cordiner's *Description of Ceylon*; in the first volume, however, of that work, at p. 363, we find so many remarks confirmatory of the confusion that has existed between the *Ficus Indica* and *religiosa*, that we do not hesitate to present the following extracts :—

"The Banyan, Indian Fig, *Allamarum*, or *Ficus Indica*, is a tree which attracts particular notice on account of one distinguishing and remarkable property. Its horizontal branches naturally extend to a great distance from the parent-stem, and being unable to support their own ponderous weight as they shoot forward, fibrous roots dip perpendicularly from them, and after touching the ground, swell to the size of massy pillars, and bear up the loaded boughs with the utmost firmness. These stems are smooth columns, covered with bark of a silver colour, and put forth no shoots. When they first leave the tree, they are of a brownish hue, as flexible as hemp, and wave in the air like ropes. After entering the earth, they become stationary, and are to be found about the same tree of various sizes, some measuring less than three inches, others upwards of eleven feet in circumference. As they at first draw their nourishment from the tree, it is probable that they afterwards return the favour by supplying it with new juices from the bountiful earth.

"The leaves are plain, entire, smooth-edged, neither heart-shaped,* nor ending in a pointed extremity. A full-grown leaf is five inches long, three and a half broad, and has a footstalk upwards of one inch in length. They grow alternately on each side of the branches, but not opposite to one another. The fruit is of the size of a small cherry, of a deep scarlet colour, and has a bright yellow circular spot round that part of it which touches the tree. The flower, like

* The leaves are retuse at the base, or slightly heart-shaped, but very different indeed from those of *F. religiosa*.—ED.

that of all other figs, is contained within the fruit, the substance of which consists of a great number of seeds of a diminutive size. These figs grow without any stalks, adhering closely in alternate positions, all round the smaller branches. They afford food for monkeys, and a variety of the feathered race, but are not sweet to the taste, and are scarcely ever eaten by man. The seeds are of such a nature, that they pass through birds unhurt, perhaps become more fit for vegetation than before, and by these means the trees are scattered over all India and the Eastern islands, and often placed in curious situations.

"Some writers, in describing this tree, have confounded its qualities with those of the *Ficus religiosa*, attributing to it the property of dropping roots from the one, and clothing it with the heart-shaped leaves of the other. An error still more palpable has been committed, in asserting that it bears no fruit."

At p. 366, we further read as follows :—

"The *Ficus religiosa* is held in great veneration both in Ceylon, and on the continent of India. In the Cingalese language it is called *bogâha*, or the tree of Buddha, and in Malabar, *Arisarum*. It drops no fibrous roots from its spreading boughs, but far surpasses the Banyan in elegance and gracefulness of form, grows to a very large size, has a smooth bark, and is perhaps the most completely beautiful of all the trees which adorn the wide garden of nature. The leaves are particularly handsome, being exactly of the form of a heart, and having a long pointed extremity, and a long footstalk. When full grown, they measure upwards of six inches in breadth at the broadest part, and eight in length, including the tapering point, which measures two inches. The fruit grows without stalks, in the same manner as that of the *F. Indica*, adhering to the smaller branches; but it is rather less in size, and does not attain, when ripe, so bright a red. This *religious fig* is accounted the most sacred of trees in India, and it is held in such high estimation in the country of Candy, that the form of its leaves is only allowed

to be painted on furniture employed exclusively for the gratification of the king. Specimens of both these fig-trees have been planted in the East India Company's garden in the island of St Helena, where, although young, they appear (1807), in a flourishing condition."

The above corroborates what we have already mentioned, viz., that the Banyan is quite a different tree from the *F. religiosa*, to which, however, it has been referred by most botanists in this country, as well as on the continent of Europe.

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*Notices of European Herbaria, particularly those most interesting to the North American Botanist.*

[In the present volume, p. 293, while giving an account of the excellent North American Flora, by Torrey and Gray, we mentioned that both authors had, in order to ensure greater correctness in the synonymy, visited most of the large herbaria in Europe. The following paper connected with that subject, has been lately communicated by Dr Gray to the *American Journal of Science*, (*Vol.* xl. No. 1.) and cannot but be interesting to the readers of this journal, who may not have an opportunity of seeing the original.]

"The vegetable productions of North America, in common with those of most other parts of the world, have generally been first described by European botanists, either from the collections of travellers, or from specimens communicated by residents of the country, who, induced by an enlightened curiosity, the love of flowers, or in some instances, by no inconsiderable scientific acquirements, have thus sought to contribute, according to their opportunities, to the promotion of botanical knowledge. From the great increase in the number of known plants, it very frequently happens that the brief descriptions, and even the figures of older authors, are found quite insufficient for the satisfactory determination of the particular species they had in view; and hence it

becomes necessary to refer to the herbaria where the original specimens are preserved. In this respect, the collections of the early authors possess an importance far exceeding their intrinsic value, since they are seldom large, and the specimens often imperfect.

With the introduction of the Linnæan nomenclature, a rule absolutely essential to the perpetuation of its advantages was also established, viz., that the name under which a genus or species is first published shall be retained, except in certain cases of obvious and paramount necessity. An accurate determination of the Linnæan species is therefore of the first importance; and this, in numerous instances, is only to be attained with certainty by the inspection of the herbaria of Linnæus and those authors upon whose descriptive phrases or figures he established many of his species. Our brief notices will therefore naturally commence with the herbarium of the immortal Linnæus, the father of that system of nomenclature, to which botany, no less than natural history in general, is so greatly indebted.

This collection, it is well known, after the death of the younger Linnæus, found its way to England, from whence it is not probable that it will ever be removed. The late Sir James Edward Smith, then a young medical student, and a botanist of much promise, was one morning informed by Sir Joseph Banks, that the heirs of the younger Linnæus had just offered him the herbarium with the other collections and library of the father, for the sum of 1000 guineas. Sir Joseph Banks not being disposed to make the purchase, recommended it to Mr Smith; the latter, it appears, immediately decided to risk the expectation of a moderate independence, and to secure, if possible, these treasures for himself and his country; and before the day closed had actually written to Upsal, desiring a full catalogue of the collection, and offering to become the purchaser at the price fixed, in case it answered his expectations.* His success, as soon

* The next day Mr Smith wrote as follows to his father, informing him of the step he had taken, and entreating his assistance:—

appeared, was entirely owing to his promptitude; for other and very pressing applications were almost immediately made for the collection, but the upright Dr Acrel having given Mr Smith the refusal, declined to entertain any other proposals while this negotiation was pending. The purchase was finally made for 900 guineas, excluding the separate herbarium of the younger Linnæus, collected before his father's death, and said to contain nothing that did not also exist in the original herbarium; this was assigned to Baron Alstrœmer, in satisfaction of a small debt. The ship which con-

"*Honoured Sir*,—You may have heard that the young Linnæus is lately dead; his father's collections and library, and his own, are now to be sold; the whole consists of an immense hortus siccus, with duplicates, insects, shells, corals, materia medica, fossils, a very fine library, all the unpublished manuscripts; in short, every thing they were possessed of relating to natural history and physic: the whole has just been offered to Sir Joseph Banks for 1000 guineas, and he has declined buying it. The offer was made to him by my friend Dr Engelhart, at the desire of a Dr Acrel of Upsal, who has charge of the collection. Now, I am so ambitious as to wish to possess this treasure, with a view to settle as a physician in London, and read lectures on natural history. Sir Joseph Banks, and all my friends to whom I have intrusted my intention, approve of it highly. I have written to Dr Acrel, to whom Dr Engelhart has recommended me, for particulars and the *refusal,* telling him if it was what I expected, I would give him a very good price for it. I hope, my dear sir, you and my good mother will look on this scheme in as favourable a light as my friends here do. There is no time to be lost, for the affair is now talked of in all companies, and a number of people wish to be purchasers. The Empress of Russia is said to have thoughts of it. The manuscripts, letters, &c., must be invaluable, and there is, no doubt, a complete collection of all the inaugural dissertations which have been published at Upsal, a small part of which has been republished under the title of *Amœnitates Academicæ;* a very celebrated and scarce work. All these dissertations were written by Linnæus, and must be of prodigious value. In short, the more I think of this affair, the more sanguine I am, and earnestly hope for your concurrence. I wish I could have one half-hour's conversation with you, but that is impossible."—*Correspondence of Sir James Edward Smith, edited by Lady Smith,* Vol. i. p. 93.

The appeal to his father was not in vain; and, did our limits allow, we should be glad to copy, from the work above cited, the entire correspondence upon this subject.

veyed these treasures to London had scarcely sailed, when the king of Sweden, who had been absent in France, returned home, and despatched, it is said, an armed vessel in pursuit. This story, though mentioned in the Memoir and Correspondence of Sir J. E. Smith, and generally received, has, we believe, been recently controverted. However this may be, no doubt the king and the men of science in Sweden were greatly offended, as indeed they had reason to be, at the conduct of the executors, in allowing these collections to leave the country; but the disgrace should perhaps more justly fall upon the Swedish government itself, and the University of Upsal, which derived its reputation almost entirely from the name of Linnæus. It was, however, fortunate for science that they were transferred from such a remote situation to the commercial metropolis of the world, where they are certainly more generally accessible. The late Professor Schultês, in a very amusing journal of a botanical visit to England in the year 1824, laments indeed that they have fallen to the lot of the "*toto disjunctos orbe Britannos;*" yet a journey even from Landshut to London, may perhaps be more readily performed than to Upsal.

After the death of Sir James Edward Smith, the herbarium and other collections, and library of Linnæus, as well as his own, were purchased by the Linnæan Society. The herbarium still occupies the cases which contained it at Upsal, and is scrupulously preserved in its original state, except that, for more effectual protection from the black and penetrating dust of London, it is divided into parcels of convenient size, which are closely wrapped in covers of strong paper lined with muslin. The genera and covers are numbered to correspond with a complete manuscript catalogue, and the collection, which is by no means large, in comparison with modern herbaria, may be consulted with great facility.

In the negotiation with Smith, Dr Acrel stated the number of species at 8000, which probably is not too low an estimate. The specimens, which are mostly small, but in excellent preservation, are attached to half-sheets of very

ordinary paper, of the foolscap size,* (which is now considered too small,) and those of each genus covered by a double sheet, in the ordinary manner. The names are usually written upon the sheet itself, with a mark or abbreviation to indicate the source from which the specimen was derived. Thus, those from the Upsal garden are marked *H. U.*, those given by Kalm, *K.*, those received from Gronovius, *Gron.*, &c. The labels are all in the handwriting of Linnæus himself, except a few later ones by the son, and occasional notes by Smith, which are readily distinguished, and indeed are usually designated by his initials. By far the greater part of the North American plants which are found in the Linnæan herbarium were received from Kalm, or raised from seeds collected by him. Under the patronage of the Swedish government, this enterprising pupil of Linnæus remained three years in this country, travelling throughout New York, New Jersey, Pennsylvania and Lower Canada: hence his plants are almost exclusively those of the Northern States.†

Governor Colden, to whom Kalm brought letters of introduction from Linnæus, was then well known as a botanist, by his correspondence with Peter Collinson and Gronovius, and also by his account of the plants growing around Coldenham, New York, which was sent to the latter, who transmitted it to Linnæus for publication in the *Acta Upsalensia*. At an early period he attempted a direct correspondence with Linnæus, but the ship by which his specimens and notes were

* Upon this subject, Dr Acrel, giving an account of the Linnæan collections, thus writes to Smith: "Ut vero vir illustrissimus, dum vixit, nihil ad ostentationem habuit, omnia vero sua in usum accommodata: ita etiam in hoc herbario, quod per XL. annos sedulo collegit, frustra quæsiveris papyri insignia ornamenta, margines inauratas, et cet. quæ ostentationis gratia in omnibus fere herbariis nunc vulgaria sunt."

† Ex his Kalmium, naturæ eximium scrutatorem, itinere suo per Pennsylvaniam, Novum Eboracum, et Canadam, regiones Americæ ad septentrionem vergentes, trium annorum decursu dextre confecto, in patriam inde nuper reducem læti recipimus: ingentem enim ab istis terris reportavit thesaurum non conchyliorum solum, insectorum, et amphibiorum, sed herbarum etiam diversi generis ac usus, quas, tam siccas quam vivas, allatis

sent was plundered by pirates;* and in a letter sent by Kalm, on the return of the latter to Sweden, he informs Linnæus that this traveller had been such an industrious collector, as to leave him little hopes of being himself farther useful. It is not probable therefore, that Linnæus received any plants from Colden, nor does his herbarium afford any such indication.† From Gronovius, Linnæus had received a very small number of Clayton's plants, previous to the publication of the *Species Plantarum;* but most of the species of the *Flora Virginica* were adopted or referred to other plants on the authority of the descriptions alone.

Linnæus had another American correspondent in Dr John

etiam seminibus eorum recentibus et incorruptis, adduxit.—*Linn. Amœn. Acad.* Vol. iii. p. 4.

* Vid. Letter of Linnæus to Haller, Sept. 24, 1746.

† The *Holosteum succulentum* of Linnæus (*Alsine foliis ellipticis carnosis* of Colden, is however marked in Linnæus's own copy of the *Species Plantarum,* with the sign employed to designate the species he at that time possessed; but no corresponding specimen is to be found in his herbarium. This plant has long been a puzzle to American botanists; but it is clear from Colden's description, that Dr Torrey has correctly referred it in his *Flora of the Northern and Middle States,* (1824), to *Stellaria media,* the common Chickweed. Governor Colden's daughter seems fully to have deserved the praise which Collinson, Ellis, and others, have bestowed upon her. The latter, in a letter to Linnæus, (April, 1758,) says: "Mr Colden of New York has sent Dr Fothergill a new plant, described by his daughter. It is called *Fibraurea,* gold-thread. It is a small creeping plant, growing on bogs; the roots are used in a decoction by the country people for sore mouths and sore throats. The root and leaves are very bitter, &c. I shall send you the characters as near as I can translate them." Then follows Miss Colden's detailed generic character, prepared in a manner which would not be discreditable to a botanist of the present day. It is a pity that Linnæus did not adopt the genus, with Miss Colden's name, which is better than Salisbury's *Coptis.* "This young lady merits your esteem, and does honour to your system. She has drawn and described 400 plants in your method: she uses only English terms. Her father has a plant called after him *Coldenia;* suppose you should call this [alluding to a new genus of which he added the characters] *Coldenella,* or any other name that might distinguish her among your genera."—*Ellis, letter to Linnæus, l. c.*

Mitchell,* who lived several years in Virginia, where he collected extensively; but the ship in which he returned to England having been taken by pirates, his own collections, as well as those of Governor Colden, were mostly destroyed. Linnæus however had previously received a few specimens, as, for instance, those on which *Proserpinaca, Polypremun, Galax*, and some other genera, were founded.

There were two other American botanists of this period, from whom Linnæus derived, either directly or indirectly, much information respecting the plants of this country, viz., John Bartram and Dr Alexander Garden of Charleston, South Carolina. The former collected seeds and living plants for Peter Collinson during more than twenty years, and, even at that early day extended his laborious researches from the frontiers of Canada, to Southern Florida, and to the Mississippi. All his collections were sent to his patron Collinson,†

* To him the pretty *Mitchella repens* was dedicated. Dr Mitchell had sent to Collinson, perhaps as early as in the year 1740, a paper in which thirty new genera of Virginian plants were proposed. This Collinson sent to Trew at Nuremberg, who published it in the *Ephemerides Acad. Naturæ Curiosorum* for 1748; but in the mean time, most of the genera had been already published, with other names, by Linnæus or Gronovius. Among Mitchell's new genera was one which he called *Chamædaphne*: this Linnæus referred to *Lonicera*, but the elder (Bernard) Jussieu, in a letter dated Feb. 19, 1751, having shown him that it was very distinct both from *Lonicera* and *Linnæa*, and in fact belonged to a different natural order, he afterwards named it *Mitchella*.

† Mr Collinson kept up a correspondence with all the lovers of plants in this country, among whom were Governor Colden, Bartram, Mitchell, Clayton, and Dr Garden, by whose means he procured the introduction of great numbers of North American plants into the English gardens. "Your system," he writes Linnæus, "I can tell you obtains much in America. Mr Clayton and Dr Colden at Albany, on Hudson's River, in New York, are complete professors, as is Dr Mitchell at Urbana, on Rapahanock River, in Virginia. It is he that has made many and great discoveries in the vegetable world."—"I am glad you have the correspondence of Dr Colden and Mr Bartram. They are both very indefatigable, ingenious men. Your system is much admired in North America." Again, "I have but lately heard from Mr Colden. He is well, but, what is marvellous, his daughter is perhaps the first lady that has so perfectly studied your system.

until the death of that amiable and simple-hearted man, in 1768; and by him many seeds, living plants, and interesting observations, were communicated to Linnæus, but few if any dried specimens. Dr Garden, who was a native of Scotland, resided at Charleston, South Carolina, from about 1745 to the commencement of the American Revolution, devoting all the time he could redeem from an extensive medical practice to the zealous pursuit of botany and zoology. His chief correspondent was Ellis at London, but through Ellis he com-

She deserves to be celebrated."—"In the second volume of Edinburgh Essays is published a Latin botanic dissertation by Miss Colden; perhaps the only lady that makes profession of the Linnæan system, of which you may be proud." From all this, botany appears to have flourished in the North American colonies. But Dr Garden, about this time, writes thus to his friend Ellis: "Ever since I have been in Carolina, I have never been able to set my eye upon one who had barely a regard for botany. Indeed I have often wondered how there should be one place abounding with so many marks of the divine wisdom and power, and not one rational eye to contemplate them; or that there should be a country abounding with almost every sort of plant, and almost every species of the animal kind, and yet that it should not have pleased God to raise up one botanist. Strange indeed that this creature should be so rare!" But to return to Collinson, the most amusing portion of whose correspondence consists of his letters to Linnæus, shortly after the publication of the *Species Plantarum*, in which, (with all kindness and sincerity) he reproves the great Swedish naturalist for his innovations, employing the same arguments which a strenuous *Linnæan* might be supposed to advance against a botanist of these latter days. "I have had the pleasure," Collinson writes, "of reading your *Species Plantarum*, a very useful and laborious work. But, my dear friend, we that admire you are much concerned that you should perplex the delightful science of botany with changing names that have been well received, and adding new names quite unknown to us. Thus botany, which was a pleasant study, and attainable by most men, is now become, by alterations and new names, the study of a man's life, and none now but real professors can pretend to attain it. As I love you, I tell you our sentiments."—*Letter of April* 20, 1754. "You have begun by your *Species Plantarum;* but if you will be for ever making new names, and altering old and good ones, for such hard names that convey no idea of the plant, it will be impossible to attain to a perfect knowledge in the science of botany."—*Letter of April* 10*th*, 1755; *from Smith's Selection of the Correspondence of Linnæus, &c.*

menced a correspondence with Linnæus; and to both he sent manuscript descriptions of new plants and animals, with many excellent critical observations. None of his specimens addressed to the latter reached their destination, the ships by which they were sent having been intercepted by French cruisers; and Linnæus complained that he was often unable to make out many of Dr Garden's genera for want of the plants themselves. Ellis was sometimes more fortunate; but as he seems usually to have contented himself with the transmission of descriptions alone, we find no authentic specimens from Garden in the Linnæan herbarium.

We have now probably mentioned all the North American correspondents of Linnæus; for Dr Kuhn, who appears only to have brought him living specimens of the plant which bears his name, and Catesby, who shortly before his death sent a few living plants which his friend Lawson had collected in Carolina, can scarcely be reckoned among the number.*

The Linnæan Society also possesses the proper herbarium of its founder and first president, Sir James E. Smith, which is a beautiful collection, and in excellent preservation. The specimens are attached to fine and strong paper, after the method now common in England. In North American botany, the chief contributors are Menzies, for the plants of California and the North-West Coast; and Muhlenberg, Bigelow, Torrey, and Boott, for those of the United States. Here also we find the cryptogamic collections of Acharius, containing the authentic specimens described in his works on the Lichens, and the magnificent East Indian herbarium of

* In a letter to Haller, dated Leyden, Jan. 23, 1738, Linnæus writes: "You would scarcely believe how many of the vegetable productions of Virginia are the same as our European ones. There are Alps in the country of New York; for the snow remains all summer long on the mountains there. I am now giving instructions to a medical student here, who is a native of that country, and will return thither in the course of a year, that he may visit those mountains, and let me know whether the same Alpine plants are found there as in Europe." Who can this American student have been? Kuhn did not visit Linnæus until more than fifteen years after the date of this letter.

Wallich, presented some years since by the East Indian Company.

The collections preserved at the British Museum, are scarcely inferior in importance to the Linnæan herbarium itself, in aiding the determination of the species of Linnæus and other early authors. Here we meet with the authentic herbarium of the *Hortus Cliffortianus*, one of the earliest works of Linnæus, which comprises some plants that are not to be found in his own proper herbarium. Here also is the herbarium of Plukenet, which consists of a great number of small specimens, crowded, without apparent order, upon the pages of a dozen large folio volumes. With due attention, the originals of many figures in the *Almagestum* and *Amaltheum Botanicum, &c.*, may be recognised, and many Linnæan species thereby authenticated. The herbarium of Sloane, also, is not without interest to the North American botanist, since many plants described in the *Voyage to Jamaica, &c.*, and the *Catalogue of the Plants of Jamaica*, were united by Linnæus, in almost every instance incorrectly, with species peculiar to the United States and Canada. But still more important is the herbarium of Clayton, from whose notes and specimens Gronovius edited the *Flora Virginica.** Many Linnæan species are founded on the plants here described, for which this herbarium is alone authentic; for Linnæus, as we have already remarked, possessed very few of Clayton's plants. The collection is nearly complete; but the specimens were not well prepared, and are therefore not always in perfect preservation. A collection of Catesby's plants exists also in the British Museum; but probably the larger portion remains at Oxford. There is besides, among the separate collections, a small but very interesting parcel selected by the elder Bartram, from his collections made in Georgia and Florida almost a century ago, and presented to

* *Flora Virginica, exhibens plantas quas J. Clayton in Virginia collegit.* Lugd. Bat. 8vo. 1743.—Ed. 2. 4to. 1762. The first edition is cited in the Species Plantarum of Linnæus; the second, again, quotes the specific phrases of Linnæus.

Queen Charlotte, with a letter of touching simplicity. At the time this fasciculus was prepared, nearly all the plants it comprised were undescribed, and many were of entirely new genera; several, indeed, have only been published very recently, and a few are not yet recorded as natives of North America. Among the latter we may mention *Petiveria alliacea* and *Ximinea Americana*, which last has again recently been collected in the same region. This small parcel contains the *Elliottia*, Muhl., *Polypteris*, Nutt., *Baldwinia*, Nutt., *Macranthera*, Torr., *Glottidium*, *Mayaca*, *Chaptalia*, *Befaria*, *Eriogonum tomentosum*, *Polygonum polygamum*, Vent., *Gardoquia Hookeri*, Benth., *Satureia* (*Pycnothymus*) *rigida*, *Cliftonia*, *Hypericum aureum*, *Galactia Elliottii*, *Krameria lanceolata*, Torr., *Waldsteinia* (*Comaropsis*) *lobata*, Torr. & Gr., the *Dolichos? multiflorus*, Torr. & Gr., the *Chapmannia*, Torr. & Gr., *Psoralea Lupinellus*, and others of almost equal interest or rarity, which it is much to be regretted were not long ago made known from Bartram's discoveries.

The herbarium of Sir Joseph Banks, now in the British Museum, is probably the oldest one prepared in the manner commonly adopted in England, of which, therefore, it may serve as a specimen. The plants are glued fast to half-sheets of very thick and firm white paper of excellent quality, (similar to that employed for merchants' ledgers, &c.,) all carefully cut to the same size, which is usually $16\frac{1}{2}$ inches by $10\frac{3}{4}$, and the name of the species is written on the lower right-hand corner. All the species of a genus, if they be few in number, or any convenient subdivision of a larger genus, are enclosed in a whole sheet of the same quality, and labelled at the lower left-hand corner. These parcels, properly arranged, are preserved in cases or closets, with folding doors made to shut as closely as possible, being laid horizontally into compartments just wide enough to receive them, and of any convenient depth. In the Banksian herbarium, the shelves are also made to draw out like a case of drawers. This method is unrivalled for elegance, and the facility with which the specimens may be found and inspected, which to a working bo-

tanist with a large collection, is a matter of the greatest consequence. The only objection is the expense, which becomes very considerable, when paper worth at least ten dollars per ream is employed for the purpose, which is the case with the principal herbaria in England; but a cheaper paper, if it be only sufficiently thick and firm, would answer nearly as well. The Banksian herbarium contains authentic specimens of nearly all the plants of Aiton's *Hortus Kewensis*, in which many North American species were early established. It is hardly proper, indeed, that either the elder or younger Aiton should be quoted for these species, since the first edition was prepared by Solander, and the second revised by Dryander, as to vol. 1 and 2, and the remainder by Mr Brown. Many American plants from the Physic Garden at Chelsea, named by Miller, are here preserved, as also from the gardens of Collinson, Dr Fothergill, (who was Bartram's correspondent after Collinson's death,) Dr Pitcairn, &c. There are likewise many contributions of indigenous plants of the United States, from Bartram, Dr Mitchell, Dr Garden, Fraser, Marshall, and other early cultivators of botany in this country. The herbarium also comprises many plants from Labrador and Newfoundland, a portion of which were collected by Sir Joseph Banks himself; and in the plants of the northern and Arctic regions is enriched by the collections of Parry, Ross, and Dr Richardson. Two sets of the plants, collected by the venerable Menzies in Vancouver's voyage are preserved at the British Museum, the one incorporated with the Banksian herbarium, the other forming a separate collection. Those of this country are from the North-West Coast, the mouth of the Oregan river, and from California. Many of Pursh's species were described from specimens preserved in this herbarium, especially the Oregan plants of Menzies, and those of Bartram, and others from the more southern United States, which Pursh had never visited, although he often adds the mark *v. v.* (*vidi vivam,*) to species which are only to be met with south of Virginia.

The herbarium of Walter still remains in the possession of

the Fraser family, and in the same condition as when consulted by Pursh. It is a small collection, occupying a single large volume. The specimens, which are commonly mere fragments, often serve to identify the species of the *Flora Caroliniana*, although they are not always labelled in accordance with that work.

The collections of Pursh, which serve as the basis of his *Flora Americæ Septentrionalis*, are in the possession of Mr Lambert, and form a part of his immense herbarium. These, with a few specimens brought by Lewis and Clark from Oregon and the Rocky Mountains, a set of Nuttall's collections on the Missouri, and also of Bradbury's, so far as they are extant, with a small number from Fraser, Lyon, &c., compose the most important portion of this herbarium, so far as North American botany is concerned. There is also a small Canadian collection made by Pursh, subsequently to the publication of his Flora, a considerable number of Menzies' plants, and other minor contributions. To the general botanist, probably the fine herbarium of Pallas, and the splendid collection of Ruiz and Pavon, (both acquired by Mr Lambert at a great expense,) are of the highest interest; and they are by no means unimportant in their relations to North American botany, since the former comprises several species from the North-West coast, and numerous allied Siberian forms; while our Californian plants require, in some instances, to be compared with the Chilian and Peruvian plants of the latter.

Besides the herbaria already mentioned, there are two others in London of more recent formation, which possess the highest interest as well to the general as to the American botanist, viz., that of Prof. Lindley, and of Mr Bentham. Both comprise very complete sets of the plants collected by Douglas in Oregon, California, and the Rocky Mountains, as well as those raised from seeds or bulbs, which he transmitted to England, of which a large portion have, from time to time, been published by these authors. Mr Bentham's herbarium is, probably, the richest and most authentic col-

lection in the world for *Labiatæ*, and is perhaps nearly unrivalled for *Leguminosæ*, *Scrophularineæ*, and the other tribes to which he has devoted especial attention: it is also particularly full and authentic in European plants. Prof. Lindley's herbarium, which is very complete in every department, is wholly unrivalled in Orchidaceous plants. The genus-covers are made of strong and smooth hardware paper, the names being written on a slip of white paper pasted on the lower corner. This is an excellent plan, as covers of white paper in the herbarium of an active botanist, are apt to be soiled by frequent use. The paper employed by Dr Lindley is 18½ inches in length, and 11½ inches wide, which, as he himself remarked, is rather larger than is necessary, and much too expensive for general use.

The herbarium of Sir Wm. J. Hooker, at Glasgow, is not only the largest and most valuable collection in the world, in the possession of a private individual; but it also comprises the richest collection of North American plants in Europe. Here we find nearly complete sets of the plants collected in the Arctic voyages of discovery, the overland journeys of Franklin to the Polar Sea, the collections of Drummond and Douglas in the Rocky Mountains, Oregon, and California, as well as those of Prof. Scouler, Mr Tolmie, Dr Gardner, and numerous officers of the Hudson's Bay Company, from almost every part of the vast territory embraced in their operations, from one side of the continent to the other. By an active and prolonged correspondence with nearly all the botanists and lovers of plants in the United States and Canada, as well as by the collection of travellers, this herbarium is rendered unusually rich in the botany of this country; while Drummond's Texan collections, and many contributions from Mr Nuttall and others, very fully represent the Flora of our southern and western confines. That these valuable materials have not been buried, nor suffered to accumulate to no purpose or advantage to science, the pages of the *Flora Boreali-Americana*, the *Botanical Magazine*, the *Botanical Miscellany*, the *Journal of Botany*, the *Icones Plantarum*, and other works

of this industrious botanist abundantly testify; and no single herbarium will afford the student of North American botany such extensive aid as that of Sir Wm. Hooker.

The herbarium of Dr Arnott of Arlary, although more especially rich and authentic in East Indian plants, is also interesting to the North American botanist, as well for the plants of the *Botany of Captain Beechey's Voyage*, &c., published by Hooker and himself, as the collection of Drummond and others, all of which have been carefully studied by this sagacious botanist.

The most important botanical collection in Paris, and indeed perhaps the largest in the world, is that of the Royal Museum, at the *Jardin des Plantes* or *Jardin du Roi.* We cannot now devote even a passing notice to the garden and magnificent new conservatories of this noble institution, much less to the menagerie, the celebrated museum of zoology and anatomy, or the cabinet of mineralogy, geology, and fossil remains, which, newly arranged in a building recently erected for its reception, has just been thrown open to the public. The botanical collections occupy a portion of this new building. A large room on the first floor, handsomely fitted up with glass cases, contains the cabinet of fruits, seeds, sections of stems, and curious examples of vegetable structure from every part of the known world. Among them we find an interesting suite of specimens of the wood, and another comprising the fruits, or nuts, of nearly all the trees of this country, both collected and prepared by the younger Michaux. The herbaria now occupy a large room or hall, immediately over the former, perhaps 80 feet long, and 30 feet wide above the galleries, and very conveniently lighted from the roof. Beneath the galleries are four or five small rooms on each side, lighted from the exterior, used as cabinets for study and for separate herbaria, and above them the same number of smaller rooms or closets, occupied by duplicate and unarranged collections. The cases which contain the herbaria occupy the walls of the large hall and of the side-rooms. Their plan may serve as a specimen of that generally

adopted in France. The shelves are divided into compartments in the usual manner; but instead of doors, the cabinet is closed by a curtain of thick and coarse brown linen, kept extended by a heavy bar attached to the bottom, which is counterpoised by concealed weights, and the curtain is raised or dropped by a pulley. Paper of a very ordinary quality is generally used, and the specimens are attached, either to half-sheets or to double sheets, by slips of gummed paper, or by pins, or sometimes the specimen itself is glued to the paper. Genera or other divisions are separated by interposed sheets, having the name written on a projecting slip.

According to the excellent plan adopted in the arrangement of these collections, which is due to Desfontaines, three kinds of herbaria have been instituted, viz.: 1. The general herbarium. 2. The herbaria of particular works or celebrated authors, which are kept distinct, the duplicates alone being distributed in the general collection. 3. Separate herbaria of different countries, which are composed of the duplicates taken from the general herbarium. To these, new accessions from different countries are added, which from time to time are assorted and examined, and those required for the general herbarium are removed to that collection. The ancient herbarium of Vaillant forms the basis of the general collection; the specimens, which are all labelled by his own hand, are in excellent preservation, and among them plants, derived from Cornuti or Dr Sarrasin, may occasionally be met with. This collection, augmented to many times its original extent, by the plants of Commerson, Dombey, Poiteau, Leschenault, &c., and by the duplicates from the special herbaria, probably contains at this time thirty or forty thousand species. Of the separate herbaria, the most interesting to us is that made in this country by the elder Michaux, from whose specimens and notes the learned Richard prepared the *Flora Boreali-Americana.*

Michaux himself, though an excellent and industrious collector and observer, was by no means qualified for authorship; and it is to L. C. Richard, that the sagacious observa-

tions, and the elegant, terse, and highly characteristic specific phrases of this work are entirely due. There is also the very complete Newfoundland collection of La Pylaie, comprising about 300 species, and a set of Berlandier's Texan and Mexican plants, as well as numerous herbaria less directly connected with North American botany, which we have not room to enumerate. Here, however, we do not find the herbaria of several authors, which we should have expected. That of Lamarck, for instance, is in the possession of Prof. Rœper at Rostock, on the shores of the Baltic; that of Poiret belongs to Moquin-Tandon of Toulouse; that of Bosc, to Prof. Moretti of Pavia; and the proper herbarium of the late Desfontaines, which, however, still remains at Paris, now forms a part of the very large and valuable collections of Mr Webb. The herbarium of Mr Webb, although of recent establishment, is only second to that of Baron Delessert; the two being far the largest private collections in France, and comprising not only many older herbaria, but also, as far as possible, full sets of the plants of recent collectors. The former contains many of Michaux's plants, (derived from the herbarium of Desfontaines,) a North American collection, sent by Nuttall to the late Mr Mercier of Geneva, a full set of Drummond's collections in the United States and Texas, &c. The latter also comprises many plants of Michaux, derived from Ventenat's herbarium, complete sets of Drummond's collections, &c. But a more important, because original and perhaps complete, set of the plants of Michaux is found in the herbarium of the late Richard, now in the possession of his son Prof. Achille Richard, which even contains a few species that do not exist in the herbarium at the Royal Museum. The herbarium of the celebrated Jussieu, a fine collection, which is scrupulously preserved in its original state, by his worthy son and successor, Prof. Adrien Jussieu, comprises many North American plants of the older collectors, of which several are authentic for species of Lamarck, Poiret, Cassini, &c.

The herbarium of De Candolle at Geneva, accumulated

throughout the long and active career of this justly celebrated botanist, and enriched by a great number of correspondents, is surpassed by few others in size, and by none in importance. In order that it may remain as authentic as possible for his published works, especially the *Prodromus*, no subsequent accessions to families already published are admitted into the general herbarium, but these are arranged in a separate collection. The proper herbarium, therefore, accurately exhibits the materials employed in the preparation of the Prodromus, at least so far as these were in Prof. De Candolle's own possession. As almost twenty years have elapsed since the commencement of this herculean undertaking, the authentic herbarium is of course much less rich in the earlier than in the later orders. The *Compositæ*, to which seven years of unremitted labour have been devoted, form themselves an herbarium of no inconsiderable size. It is unnecessary to enumerate the contributors to this collection, (which indeed would form an extended list,) since the author, at least in the later volumes of the *Prodromus*, carefully indicates, as fully as the work permits, the sources whence his materials have been derived. The paper employed is of an ordinary kind, somewhat smaller than the English size, perhaps about fifteen inches by ten; and the specimens are attached to half-sheets by loops or slips of paper fastened by pins, so that they may readily be detached, if necessary, for particular examination. Several specimens from different sources or localities, or exhibiting the different varieties of a species, are retained when practicable; and each species has a separate cover, with a label affixed to the corner, containing the name and a reference to the volume and page of the *Prodromus* where it is described. The limits of genera, sections, tribes, &c., are marked by interposed sheets, with the name written on projecting slips. The parcels which occupy each compartment of the well-filled shelves, are protected by pieces of binder's board, and secured by a cord, which is the more necessary as the cases are not closed by doors or curtains.

The royal Bavarian herbarium at Munich, is chiefly valuable for its Brazilian plants, with which it has been enriched by the laborious and learned Martius. The North American botanist, will, however, be interested in the herbarium of Schreber, which is here preserved, and comprises the authentic specimens described or figured in his work on the grasses, the American specimens mostly communicated by Muhlenberg. The *Gramineæ* of this and the general herbarium, have been revised by Nees von Esenbeck, and still later, by Trinius. It was here that the latter, who for many years had devoted himself to the exclusive study of this tribe of plants, and had nearly finished the examination of the chief herbaria of the continent, preparatory to the publication of a new Agrostographia, was suddenly struck with a paralysis, which has probably brought his scientific labours to a close.

The Imperial herbarium of Vienna, under the superintendence of the accomplished Endlicher, assisted by Dr Fenzl, is rapidly becoming one of the most valuable and extensive collections in Europe. The various herbaria of which it is composed, have recently been incorporated into one, which is prepared nearly after the English method. It however possesses few North American plants, except a collection made by Enslin, (a collector sent to this country by Prince Lichtenstein, from whom Pursh obtained many specimens from the Southern States,) and some recent contributions by Hooker, &c. There is also an imperfect set of the plants collected by Hænke, (a portion of which are from Oregon and California,) so far as they are yet published in the *Reliquiæ Hænkeanæ* of Presl, in whose custody, as curator of the Bohemian museum at Prague, the original collection remains.

The herbarium of the late Prof. Sprengel still remains in the possession of his son, Dr Anthony Sprengel, at Halle, but is offered for sale. It comprises many North American plants, communicated by Muhlenberg and Torrey. The herbarium of Schkuhr was bequeathed to the university of

Wittemberg, and at the union of this university with that of Halle, was transferred to the latter, where it remains under the care of Prof. Von Schlechtendal. It contains a large portion of the *Carices* described and figured in Schkuhr's work, and is therefore interesting to the lovers of that large and difficult genus. The American specimens were mostly derived from Willdenow, who obtained the greater portion from Muhlenberg.

The royal Prussian herbarium is deposited at Schöneberg, (a little village in the environs of Berlin,) opposite the royal botanic garden, and in the garden of the Horticultural Society. It occupies a very convenient building erected for its reception, and is under the superintendence of Dr Klotzsch, a very zealous and promising botanist. It comprises three separate herbaria, viz., the general herbarium, the herbarium of Willdenow, and the Brazilian herbarium of Sello. The principal contributions of the plants of this country to the general herbarium, garden-specimens excepted, consist of the collections of the late Mr Beyrich, who died in Western Arkansas while accompanying colonel Dodge's dragoon expedition, and a collection of the plants of Missouri and Arkansas, by Dr Engelmann, now of St Louis; to which a fine selection of North American plants, recently presented by Sir William Hooker, has been added. The botanical collections made by Chamisso, who accompanied Romanzoff in his voyage round the world, also enrich this herbarium; many are from the coast of Russian America and from California; and they have mostly been published conjointly by the late Von Chamisso and Prof. Schlechtendal in the *Linnæa*, edited by the latter.

The late Professor Willdenow enjoyed for many years the correspondence of Muhlenberg, from whom he received the greater part of his North American specimens, a considerable portion of which are authentic for the North American plants of his edition of the *Species Plantarum*. In addition to these, we find in his herbarium many of Michaux's plants, communicated by Desfontaines, several from the German collector,

Kinn, and perhaps all the American species described by Willdenow from the Berlin garden. It also comprises a portion of the herbarium of Pallas, the Siberian plants of Stephen, and a tolerable set of Humboldt's plants. This herbarium is in good preservation, and is kept in perfect order and extreme neatness. As left by Willdenow, the specimens were loose in the covers, into which additional specimens had sometimes been thrown, and the labels often mixed, so that much caution is requisite to ascertain which are really authentic for the Willdenovian species. To prevent farther sources of error, and to secure the collection from injury, it was carefully revised by Prof. Schlechtendal, while under his management, and the specimens attached by slips of paper to single sheets, and all those that Willdenow had left under one cover, as the same species, are enclosed in a double sheet of neat blue paper. These covers are numbered continuously throughout the herbarium, and the individual sheets or specimens in each are also numbered, so that any plant may be referred to by quoting the number of the cover, and that of the sheet to which it is attached. The arrangement of the herbarium is unchanged, and it precisely accords with this author's edition of the *Species Plantarum*. Like the general herbarium, it is kept in neat portfolios, the back of which consists of three pieces of broad tape, which, passing through slits near each edge of the covers, are tied in front; by this arrangement their thickness may be varied at pleasure, which, though of no consequence in a stationary herbarium, is a great convenience in a growing collection. The portfolios are placed vertically on shelves protected by glass doors, and the contents of each are marked on a slip of paper fastened to the back. The herbaria occupy a suite of small rooms distinct from the working rooms, which are kept perfectly free from dust.

Another important herbarium at Berlin, is that of Prof. Kunth, which is scarcely inferior in extent to the royal collection at Schöneberg, but it is not rich or authentic in the plants of this country. It comprises the most extensive and

authentic set of Humboldt's plants, and a considerable number of Michaux's, which were received from the younger Richard. As the new *Enumeratio Plantarum* of this industrious botanist proceeds, this herbarium will become still more important.

For a detailed account of the Russian botanical collections and collectors, we may refer to an historical sketch of the progress of botany in Russia, &c., by Mr Bongard, the superintendent of the Imperial Academy's herbarium at St Petersburgh, published in the *Recueil des Actes* of this institution for 1834. An English translation of this memoir is published in the first volume of Hooker's *Companion to the Botanical Magazine.*

A. G.

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## XXV.—NOTES *and* NOTICES *in reference to* BRITISH MUSCOLOGY. By W. WILSON, ESQ., of Warrington.

1. Phascum *crassinervium, var. stenophyllum, Bruch and Schimper, Bryol. Europ. Fasc.* i. *t.* 2.—Found several years ago in Cheshire, by the writer of this note. Perhaps the British Moss ought to be rather referred to the typical form of *P. crassinervium*, figured by Bruch and Schimper; this variety certainly exhibits little character, but both are quite distinct from *P. crassinervium* of Greville, *Fl. Crypt. Scot.*

2. P. *alternifolium.*—There is no doubt that the British Moss so called, is identical with *Archidium phascoides, Schwaegr. Suppl. t.* 205, and of *Bruch and Schimper, Bryol. Europ. Fasc.* i. It is scarcely less certain, however, that *Phascum alternifolium, Schwaegr. Suppl. t.* 10, is the same moss, if the figure is to be depended on; yet neither Schwaegrichen, nor Bruch and Schimper take this view.—*P. alternifolium,* Bruch and S., is scarcely distinguished, except as a variety, from *P. subulatum.*

3. P. *Floerkeanum, Schwaegr. Suppl. t.* 3.—This very interesting addition to the list of British *Phasca*, has lately

been made by Mr R. B. Bowman of Newcastle, who finds it on the coast of Durham.

4. P. *pachycarpum, Schwaegr. Suppl. t.* 2. *Bruch and Schimper, Br. Eur. Fasc.* i. *t.* 2.—This has likewise been found by the same gentleman in the same neighbourhood. It is not an entirely new discovery, however; because *P. crassinervium, Grev. Fl. Crypt. Scot.*, is unquestionably the same Moss incorrectly named, if the two authors above quoted are to be relied upon.

5. Hedwigia *Hornschuchiana, Hook. Musc. Exot. t.* 103.—This Moss, in a barren state, has been found near Killarney, in Ireland, by Dr Taylor.

6. Gymnostomum *Wilsoni.*—The station for this species near Forfar is inauthentic. Drummond's specimens probably belong to what was originally intended to be called *G. obtusum, Engl. Bot.;* but such is the confusion relating to that Moss, that no certain conclusion can be made concerning it.

7. G. *microstomum.*—At the time when the remarks published in Hooker's *Brit. Fl.* were written, genuine specimens of this Moss were unknown to the writer, who had under review, as it would seem, a state of *Weissia controversa*, with abortive peristome. An excellent account of the true species has been given by Mr Valentine in the *Muscologia Nottinghamiensis.* That acute observer has shown that the capsule or theca of Mosses is properly composed of three integuments, viz., the outer one termed the theca; an inner one called the thecal membrane which adheres to the outer covering or theca; the innermost is called the *sporular sac.* In this Moss, the *thecal membrane* nearly closes up the mouth of the capsule, and forms the thin annular border; the sporular sac is united at the top with the columella, so as to forbid egress to the seeds or sporules until long after the fall of the operculum, and probably until the theca itself falls from the seta or becomes broken by decay.

Notwithstanding these apparently satisfactory characters, it is not yet perfectly clear to the writer of this note, that

this Moss is essentially and permanently distinct from *Weissia controversa.*

8. Œdipodium *Griffithianum.*—The seta tapers gradually from the capsule down to the vaginula, and seems everywhere to be fistulous, having a loose medullary centre; it may therefore be considered as entirely consisting of an *apophysis*, and thus the capsule is properly sessile. The sporular sac in this Moss presents considerable affinity to *Hymenostomum.* It is in an early stage connected with the conical apex or prolongation of the columella, (termed the metula by Mr Valentine), but in the ripe capsule it forms a loose membranous border within the mouth of the capsule. The seeds are connected in fours.

9. Anictangium *imberbe.*—Some confusion has arisen respecting this Moss. The genuine species so called, was really detected in Ireland by the late Miss Hutchins. It differs from *A. ciliatum*, in its *conical* prominent operculum, coloured calyptra, and in the recurved margins of the leaves. In habit, this Moss has very considerable resemblance to *Grimmia apocarpa.* It is found rather plentifully near Llanberis, and near Beddgelert in N. Wales.

10. Diphyscum *foliosum.*—The figure of the peristome in the admirable *Bryologia Europæa*, of Bruch and Schimper, is not quite accurate. No distinct loose outer teeth are visible, and the parts so represented are probably pulverulent fragments of the margin of the operculum, (perhaps of an imperfectly formed annulus.) Traces of outer teeth do nevertheless exist at the angles of the plicate membrane forming the peristome, as may be most satisfactorily observed in an annular or transverse section of the part carefully made with a sharp instrument. It may not be amiss here to state, that careful dissection under the microscope, proves that the peristomes of Mosses usually termed single, do in many instances, (and perhaps might in all) show that they consist of two separable and differently coloured laminæ; this obtains in the Cape Moss called *Wardia hygrometrica*, in *Trematodon longicollis*, and in the most unlikely of all Mosses *Cinclidotus*

*fontinaloides;* in all the *Polytricha,* and in *Entosthodon Templetoni.*

11. *Splachnum.*—This genus of Mosses is very peculiarly distinguished from all others by the arrangement of its seeds or sporules. They are disposed in radiating lines containing from eight to fourteen or more sporules, and these lines seem to be also connected together in fours; the number varies in different species. This character appears to be constant, but is most observable in *Splachnum sphæricum.* No distinct tubular sporidia have been detected, but there seems to be in this respect considerable analogy between this tribe of Mosses and the Fungi.

12. Encalypta *affinis, Engl. Bot.*—This is a perfectly distinct species, called by the authors of *Bryologia Europæa, E. commutata,* destitute of peristome, and the leaves gradually tapering to an acute point. It is common on the tops of the Breadalbane mountains.

13. E. *streptocarpa.*—In the year 1832, before the appearance of the *Bryologia Europæa,* the writer of this had detected a double peristome in this species, and in the exotic *E. procera.* It would indeed appear that the peristome is little to be depended upon as a generic character for *Encalypta,* and perhaps Bruch and Schimper have good reason to place *Gymnostomum viridissimum* in company with *Zygodon conoides.*

14. Weissia *tenuirostris.*—This Moss was discovered by Dr Taylor many years ago at Campsie, near Glasgow; but from the great rarity of fructification, and probably from some local causes affecting the development of the peristome, its true structure appears to have been long misunderstood, and the figure given in *Muscologia Britannica* is incorrect. Having in October last found the Moss in some plenty, and in a state of great luxuriance and perfection in the neighbourhood of Dolgelley, N. Wales, I am induced to offer the following remarks, which will not be thought unimportant, when the close resemblance of this plant to *Tortula tortuosa* is considered.

After having completely dissected a number of the finest specimens, I feel satisfied that this Moss ought to be removed to the genus *Didymodon*. It is only in starved specimens that I find sixteen simple teeth, and even some of these under a good doublet or triplet lens, exhibit sufficient traces of division into geminate processes. In those peristomes, which are perfect, there are sixteen decidedly geminate slender teeth, by no means horizontal, as represented in *Musc. Brit.*, but nearly erect, at least twice as long as the diameter of the mouth of the capsule, and surrounding that conical prolongation of the columella (termed the *metula* by Mr Valentine, opercular membrane of Arnott,) which fills up the cavity of the operculum. In old specimens the peristome appears to be less erect, but the teeth can scarcely in any instance be regarded as horizontal, and their remarkably slender form is very unlike the figure referred to.

My remarks would terminate here if doubts concerning the identity of this Moss with *Tortula tortuosa* had not been frequently entertained, and if the Moss last named had not recently been by Dr Taylor himself placed in the genus *Didymodon*.

In *Weissia* (*Didymodon*) *tenuirostris*, I find the innovations or barren shoots very different from those of *Tortula tortuosa*, the leaves being much shorter, more linear in form, more obtuse at the extremity, and less crisped in a dry state; they are widely-spreading, recurved, and by no means crowded. The operculum presents no mark whatever of spiral arrangement of its cellular tissue; nor does the peristome exhibit any tendency to take a spiral, or even an inclined direction. I conclude therefore that the Moss is distinct from *Tortula tortuosa*, although circumstances having hitherto prevented me from rigorously comparing the two together, it may not be altogether safe to insist much upon their diversity.

In addition to what has already been said, I may state the following particulars:—*Weissia tenuirostris* has a very obscure *annulus*, adherent to the margin of the operculum, and somewhat more deeply coloured.—Capsule narrowly lanceolate, tapering towards the base, often somewhat bent, and the

mouth a little contracted. Operculum subulate. Calyptra dimidiate, twisted. Setæ frequently two or three together. Vaginula cylindrical. Perichætial leaves very small. Leaves composed of a somewhat granular substance, fragile, minutely scabrous in the margin, which is nearly plane.

This species was observed in several stations in North Wales, viz., in the rocky dell above Dolgelley, and by the roadside leading westward under Cader Idris; also near Pont Aberglaslyn, one mile from Beddgelert. It has likewise been found in Ireland near Killarney, by Dr Taylor, but in a perfect state it appears to be one of the very rarest of our British Mosses.

15. *Weissia affinis*.—Before this Moss can be established as a good species, further investigation seems to be requisite. If any permanent mark of difference exist between it and *Gymnostomum conicum*, it will be found not in the peristome, which is extremely variable, but in the form of the capsule, which in *Weissia affinis* is elliptical, and somewhat contracted at the mouth. After having bestowed much pains in the examination of numerous specimens, I am compelled to leave the question undetermined.

16. *Fissidens osmundioides*.—An essential difference between this Moss and *Dicranum bryoides* of *Musc. Brit.*, has long ago been pointed out by Wahlenberg, and since verified by Meyrin and the writer of this note. The calyptra is mitriform, with the margin strongly turned inward, and the leaves are destitute of the cartilaginous margin observable in *D. bryoides*, which has the calyptra truly dimidiate, and a shorter operculum.

17. *Dicranum Schreberianum*.—The genuine Moss figured in *Hedw. Sp. m. t.* 33, has been found in Lancashire, and more recently near Glasgow. The lid is shorter than in the Moss found in Glen Tilt, which is either a well marked variety, or more probably a distinct species, for which Bridel proposes the name *D. Grevilleanum*.

18. D. *polycarpum* has been recently found on Cader Idris by Mr Ralf.

19. D. *Starkii.*—Probably it will be found that this is not specifically distinct from *D. falcatum.* On the Clova Mountains intermediate states are frequent; they differ in nothing but the shape of the capsule.

20. D. *flagellare.*—It now appears that no genuine examples of the Moss figured in *Hedw. Musc. Frond.*, vol. iii. *t.* 1. have been found in Ireland. The specimens so called in the *British Flora* of Hooker belong to *D. Scottianum.* The synonym *D. montanum, Hedw. Sp. Musc. t.* xxxv., seems to be misapplied; but there is remarkable confusion on this subject among continental muscologists, whose communications under this name are extremely contradictory, as may be seen on reference to the Hookerian herbarium. *D. flagellare* will be found to differ from the *D. Scottianum* in the deeply bifid teeth, and in the capsule which is ribbed and less contracted at the mouth.

21. D. *undulatum.*—No satisfactory specimens exist in the Hookerian herbarium to prove that *Dicran. polysetum* of *Schwaegr. Suppl. t.* xli. has ever been found in Britain. The British Moss is perhaps only a var. of *D. scoparium,* with undulated leaves.

22. *Grimmia saxicola.*—This rare Moss I have found in Derbyshire, (1832) near Crich, and near Rowsley. It has since been found near Todmorden, Lancashire, by John Nowell.

23. G. *atrata,* has again been found on Snowden last year, but not plentifully. It was gathered on the precipice called Clogwyn dû 'r arddu.

24. *Didymodon longirostris? Hook. Br. Fl.* is most probably *D. flexicaulis.* Near Matlock in Derbyshire it is not uncommon, but is always barren.

25. *Trichostomum canescens.*—The peristome has the teeth united at the summits, almost the same as in *Conostomum boreale.*

26. T. *aciculare γ. gracile. Turn. Musc. Hib., p.* 67.—May not this be *Racomitrion cataractarum, Bridel. Br. Un.,* vol. i. *p.* 776? The writer of this has met with a Moss in

Nant Frangon, N. Wales, which could not be satisfactorily referred to any British described species, and it is probably the species or variety now under consideration.

27. *Glyphomitrion Daviesii.*—This has been found in some plenty near Llanberis, at the foot of Snowden, by Mr Valentine and Mr Ralf.

28. *Cinclidotus fontinaloides.*—The upper portion of the peristome is closely united to the columella, which, shrinking downward as it dries, always causes a fracture of the teeth in the mature capsule; hence the peristome appears shorter than it really is; the operculum exhibits a spiral arrangement of its cells, and the peristome partakes much of the nature of a *Tortula.* The fructification of this Moss can with difficulty be called terminal.

29. *Trichostomum patens, β. piliferum.*—Some muscologists seem to have overlooked Dr Arnott's excellent remark in the addenda to Hooker and Taylor's *Musc. Brit.*, and to have regarded this Moss as *T. funale, Schwaegr. Suppl. t.* 37. It may nevertheless be truly distinct from *T. patens,* which has a very remarkable structure of the nerve of the leaf, which has at the back two winged projections, not at all visible in the variety now under consideration. This latter Moss is indeed very closely allied to *Grimmia trichophylla.*

30. *Funaria Muhlenbergii.*—No one who has carefully observed the prominent operculum, its scarcely reddened margin, the smooth border of the mouth of the capsule, and the large rough seeds, thrice the diameter of those of *F. hygrometrica,* would even think of uniting these two species. The experiment of Mr James Drummond cannot by any means be considered satisfactory; because it is as difficult to ensure the absence of the seeds of so common a Moss as *Funaria hygrometrica,* as it is to cultivate *F. Muhlenbergii,* in any but a calcareous soil. *F. hygrometrica* may always be infallibly distinguished from *F. Muhlenbergii,* by a distinctly corrugated border surrounding the very oblique mouth of the peristome, by the deeply coloured margin of the flattened operculum, and by the large and very distinct annulus.

31. F. *Hibernica.*—No good specimens of this Moss exist in the Hookerian herbarium, and it is most probably not distinct from *F. hygrometrica,* which, in reality, (as was first pointed out to me by Mr John Nowel,) has the lower leaves of the stem plane and minutely serrated.

32. *Polytrichum.*—The "membrane" which connects the teeth of the peristome is an hemispherical expansion of the columella, to which in most species it permanently adheres. It is in fact a modification of the opercular membrane, or *metula.* The propriety of the latter name is clearly exemplified in this genus, because the metula in this case does not rise higher than the apices of the teeth of the peristome. The substance which fills the operculum is, as Mr Valentine has justly pointed out, an expansion of a portion of the thecal membrane. The teeth of the peristome consist of two laminæ, of which the innermost (as in every case where an inner peristome exists at all) is connected with the sporular sac.

33. P. *aloides* and P. *nanum.*—These two Mosses have generally been considered scarcely distinguishable. It would appear, however, that they are truly distinct species. The first of these has a 4-winged columella; the other a cylindrical one, with large seeds. *P. nanum,* therefore, ought to be removed from the very doubtful genus *Pogonatum* of Bridel.

34. *Bryum squarrosum.*—No second locality in Britain for this Moss has yet been found; and there is reason to apprehend that the Moss no longer grows upon Knutsford moor; the ground having been drained and levelled.

35. B. *Tozeri.*—This rare species has been found on the banks of the Lee, near Cork, by Mr W. T. Alexander, and near Penzance, by Mr Ralfs.

36. B. *annotinum, Hedwig.*—Certainly distinct from *B. turbinatum,* with a much closer affinity to *B. nutans.* In a stone quarry, two miles north of Warrington, this usually barren Moss produces fruit in considerable plenty, and the barren gemmiferous shoots are there comparatively unfrequent. The capsule has a pale waxy hue.

37. *Cinclidium Stygium.*—Discovered in the year 1836, near Malhany iu Yorkshire, by John Nowell of Todmorden. A second locality in the same neighbourhood was found afterwards by the writer of these notes. The capsules are ripe in June.

38. *Glyphocarpa? cernua.* MS.—A curious little Moss found on Connor Hill in Ireland in the year 1829, and subsequently at Curn Bychan, near Harlech, by the Rev. Mr Salwey. It is quite destitute of a proper peristome, with a drooping pyriform capsule. In other respects it closely resembles *Bartramia fontana* in miniature, and may perhaps be only a variety.

39. *Buxbaumia aphylla.*—New localities for this very rare Moss have recently been detected in the Bowling hills, near Glasgow, by Mr G. J. Lyon; and on the Sedlaw hills, Forfarshire, by Mr W. Gardner, Junr.

40. *Pterogonium filiforme.*—The British Moss, so called, having by some been regarded as only a state of *Pt. gracile*; it may be proper to observe, that, in addition to the papillose surface of the leaves of *Pt. filiforme*, the margin is reflexed, and by that mark easily distinguished. In fructification *Pt. filiforme* is exceedingly rare; the only station known to the writer is on Ben-Cruachan, near Killin, Perthshire.

41. *Anomodon curtipendulum.*—The genus *Anomodon* appears to be founded on insufficient characters: in the species before us the inner peristome is quite unattached to the outer, and is in every respect similar to that of *Neckera*.

42. *Daltonia* is another apparently spurious genus. A new species, *D. nervosa*, found in the southern United States by the late Mr Thomas Drummond, has a dimidiate calyptra, while in *Neckera pennata* the capsule is immersed, and the calyptra mitriform.

43. *Daltonia splachnoides* (now removed to the genus *Hookeria*,) has been recently found near the summit of Brandon Mountain, Ireland, by Mr D. Moore.

44. *Hypnum tenellum.*—This Moss, according to Bridel, and in opposition to Schwægrichen, ought to be called *H.*

*Algirianum*, by which name it has been long well known on the continent, while the older British muscologists supposed it to be peculiar to the British Islands. See *Bryol. Univ.* vol. ii. *p.* 593.

The "variety with serrulated foliage," mentioned in *Hooker's British Flora*, vol. ii. *p.* 77, is now ascertained to be a distinct Moss, having a scabrous fruit-stalk. It is probably *H. Schleicheri, Bridel. Br. Un.*, vol. ii. *p.* 403, and has been also found at Bowling-Bay, near Glasgow, and at Nant y Fridd, near Wrexham.

45. H. *demissum, Wils. in Engl. Bot. Suppl. t.* 2740.—This is the same Moss as that described in Hooker's *Br. Fl. v.* ii. *p.* 79, under the name of *H. flavescens*, the name *demissum* having been substituted for one liable to produce confusion from its resemblance to the names of already described species.

46. H. *catenulatum*.—The operculum is more properly *rostrate* than "conico-acuminate," as it is described in the *British Flora*. Foliage frequently secund; the fruit ripens about December; but is extremely rare. Fertile specimens have been gathered by the writer near Dolgelley, and near Beddgelert, in N. Wales.

47. H. *incurvatum*.—This recent addition to our list of British Mosses, was found by the writer in Helk's wood near Ingleton, in 1837, and also near Kendal, on the road to Ambleside. The fruit ripens about midsummer.

48. H. *circinnatum, Bridel, Br. Un. v.* ii. *p.* 447.—A Moss, answering to this description, was found many years ago by the writer at Tyfry in Anglesea, and earlier still at Netley Abbey by Mr Borrer. I have the same Moss from Mr Arnott marked "*Pterogonium nervosum*, Montpelier." Bridel is probably in error in referring this Moss to *H. strigosum*, Hoffm. If it be not a distinct species (which I think it is) its affinity is rather with *H. alopecurum*. In every instance this Moss seems to have been found on calcareous rocks. At Tyfry it is found with abortive perichætia; but the fructification is altogether unknown.

49. H. *flagellare.*—The scabrous seta is an important character which has been hitherto omitted by recent describers, though recorded in English Botany. It is difficult to suppose that this Moss is entirely confined to the British islands; yet it certainly does not occur in the collection of Mougeot and Nestler. *H. umbratum*, Ehrh. No. 329 of that work, is with much difficulty distinguishable from *H. brevirostrum*, Ehrh. No. 423, having like it, a smooth seta. *H. umbratum, Sm. Fl. Brit. p.* 1298, is probably the same Moss as No. 329, of Mougeot and Nestler; and if so, Sir J. E. Smith has improperly quoted it in *Engl. Bot.*

50. H. *laricinum, Hook. Br. Fl. v.* ii. *p.* 87, and *Suppl. to Engl. Bot. t.* 2760.—This is unquestionably *H. Blandovii, Schwaegr. Suppl. t.* 142. The locality at Tunbridge Wells is somewhat doubtful; but on Knutsford Moor, in Cheshire, it may still be found rather plentifully, bearing fruit freely in April and May.

51. H. *blandum.*—With equal certitude this Moss may be referred to *H. illecebrum, Lin.* (not *H. illecebrum, Hedw.*, which is *H. Boscii, Schwaegr. Suppl.*)*

52. H. *crassinervium.*—Since the discovery of this Moss in Ireland, it has been found by the writer near Matlock in Derbyshire, at Beaumaris in Anglesea, and near Ingleton in Yorkshire, always, or usually at least, growing upon calcareous rocks.

53. H. *cæspitosum. Wils. MSS.*—This yet unpublished species, nearly allied to *H. blandum*, but with an erect capsule, and secund foliage, though rather abundant near Warrington, has not been elsewhere observed. The fruit ripens in November.

54. H. *fluviatile, Swartz; Hedw. Sp. Musc. t.* 81.—This Moss, not yet admitted into the published list, was found near Bangor by the writer in 1828, when it was confounded with

* The following memorandum was made by Dr Arnott, thirteen years ago, on the editor's copy of the *Muscol. Brit.* "*H. illecebrum*, Schw. is *H. illecebrum, E. Bot. t.* 2189, has serrated leaves, and with it *H. blandum* is identical. It is figured by Vaillant in his *Flor. Pav.*"—Ed.

*H. atrovirens.* It has since been gathered near Warrington. Fruit ripe in April.

55. H. *rugulosum.*—Fertile specimens gathered at Beaver Lake, are given in Drummond's *Musci Americani,* No. 198, though not noticed in *Hook. Br. Fl.* Capsule cylindrical, very much bent. Operculum conico-rostrate. Seta smooth. It is a true *Hypnum.*

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## NOTES *on the* HEPATICÆ *in Hooker and Taylor's Musc. Brit.*

1. Sphærocarpus *terrestris.*—Fine specimens of this plant gathered by the late Thomas Drummond in Louisiana, prove that the capsule is covered (as is usual) with a calyptra, which, however, from its extreme tenuity can only be detected in an early stage. The anthers are found in folliculose bodies covering the upper surface of the nerve on separate fronds.

2. Riccia *fluitans.*—Abundance of this plant, in a perfect state of fructification, was found by the writer, in September, 1834, on the dried shores of a lake called Mere in Cheshire. It is a true *Riccia.*

3. Jungermannia *lanceolata, Lin.; Hook. Jung. t.* 18.—Until very lately, this species has been regarded as very doubtfully British. It has, however, been recently gathered very sparingly, on Harrison's Rocks (Tunbridge Wells?) by Mr E. Jenner, whose specimen agrees exactly with No. 527, of Mougeot and Nestler.

4. J. *sphærocarpa,* and *J. hyalina.*—Satisfactory characters, by which these two estimated species may be distinguished, are much wanted.

5. J. *inflata,* and J. *turbinata.* Wils.—At the time when the writer described *J. turbinata* in the *Suppl.* to *Engl. Bot.* he had not access to the original work, and it now appears that *J. turbinata,* which is certainly distinct from *J. inflata* of *Hook. Brit. Jung. t.* 38, has been twice figured in *Engl. Bot.*, first at *t.* 2512, under the name of *J. inflata,* (which figure has been erroneously quoted in *Hook. and*

*Tayl. Musc. Brit. p.* 230), and subsequently by the writer at *t.* 2744, under its proper name. The two species are very distinct, though hitherto very frequently confounded.

6. J. *curvifolia.*—The leaves of this species have a decided auricle at the base.

7. J. *nimbosa. Taylor, MSS.*—Specimens, so called from Brandon Mountain in Ireland, are intermediate between *J. nemorosa*, and *J. planifolia.* It has been found only in a barren state.

8. J. *Dicksoni.*—This has been found in Wales by Mr Ralfs, on Brecon Beacon, and upon Cader Idris.

9. J. *scutata.*—The localities for this species given on the authority of the writer, in Hooker's *Brit. Fl. v.* ii. *p.* 118, are incorrect. The plant there alluded to is *J. laxifolia*, a species possessed of stipules, but not described as such in *Hook. Brit. Jung.*

10. J. *Hutchinsiæ.*—Occurs near Dolgelley. It has also been found near Glasgow, by Mr Gourlie.

11. J. *pubescens.*—Essentially distinct from *J. furcata*, in the alternate (not dichotomous) ramification of the frond.

12. J. *Lyellii.*—This is most probably distinct from *J. Hibernica.* Specimens of *J. Lyellii*, gathered in the United States by Drummond, have a woolly midrib and a cylindrical capsule, very distinct from *J. Hibernica*, figured by the writer in *Suppl. to Engl. Bot. t.* 2750. Further investigation of the British *J. Lyellii* is therefore very desirable.

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## XXVI.—*Remarks on the* FRUIT *of the Natural Order* CUCURBITACEÆ. By ROBERT WIGHT, M.D., F.L.S., &c.

THE order *Cucurbitaceæ*, is perhaps one of the most curious and inexplicable in the system of plants, and though at different times much studied by several eminent botanists, is still imperfectly understood, at least if we may judge from the fact, that no two writers on the distribution of plants according to their natural affinities, seem to agree as to what families

are its nearest allies. It is not now my intention to examine this question, for which, indeed, I have not at present leisure, even supposing I possessed the requisite materials, which I do not, but merely to offer a few observations on the general character of the family and fruit.

The *Cucurbitaceæ* are a tribe of plants so very unlike the rest of the vegetable kingdom, that I think I may safely say, no one having the slightest knowledge of family likeness among plants, could ever mistake so far as to refer one of them to any other family. Though thus isolated from all around, and without a single near relation, with whom they can be justly compared or confounded, they yet stretch their more remote affinities on all sides; hence the difficulties which systematic writers find in decisively referring them to any one place, more than another, in the series of orders. Nearly all, however, now agree in placing them among orders having parietal placentæ, that is among plants, the ovary of which is one-celled.

To any one who will take the trouble to look attentively at a slice of a young cucumber this must appear strange, but is yet, not the less true. In one of the latest and the best introductions to botany in the English language, Dr Lindley's, a peponida, the peculiar fruit of the order, is thus defined:

"One-celled, many-seeded, inferior, indehiscent, fleshy; the seeds attached to parietal pulpy placentæ. This fruit has its cavity frequently filled at maturity with pulp, in which the seeds are imbedded; their point of attachment is, however, never lost. The cavity is also occasionally divided by projections of the placentæ into spurious cells, which has given rise to the belief that in *Pepo macrocarpus* there is a central cell, which is not only untrue but impossible."

Dr Arnott in the article "Botany," *Encyclop. Brit. Ed.* 7, gives a different account of it; but still, it appears to me, far from a correct one, namely:—

"A *pepo* or *peponida*, is a fleshy inferior fruit, either indehiscent or bursting irregularly, and consisting of about

three carpels, each of which is divided into two cells by its placentiferous margin, being so introflexed as to reach the dorsal suture. The sides of the carpel, and even sometimes the introflexed portion, usually become extremely thick and fleshy, forming the great mass of the ripe fruit, so that by losing the general character of dissepiments, they might almost be said to disappear, and thus at first sight a *pepo* would be said to be, and has been so described, a 1-celled, fleshy, indehiscent fruit, with parietal placentæ that send out sometimes false dissepiments towards the axis, as the cucumber and gourd."

This view, therefore, is essentially different from Dr Lindley's; for, according to Arnott, the placentæ are virtually central, not parietal. The only difference between a pepo and an apple, being according to him, that the placentiferous margins of the carpellary leaf are introflexed, and extend outward nearly to the parietes of the fruit, in place of remaining in the axis. Lindley, on the other hand, views a pepo simply as a one-celled fruit with parietal placentæ, the cavity being occasionally divided into spurious cells by projections of the placentæ. Neither is altogether consonant with appearances, though that of Arnott appears the most so; but both, in common with all others that have yet been promulgated, are incorrect both as to theory and fact.

While our ideas of the structure of the most essential organ of the plant, with reference to natural affinities, are thus vague, can it be matter of surprise that we are unable to trace its relations, and determine its affinities in the system of plants?

What then is a peponida? I have said above that it is neither a one-celled fruit with parietal placentæ, nor a three-celled one with introflexed central placentæ. But before I can say what it is, and point out the difference between it and a fruit of the usual construction, it is necessary to state what the usual structure is. This I shall do by means of a short extract from Lindley's *Key to Structural Botany*.

354. "A Carpel is formed by a folded leaf, the upper

surface of which is turned inward, the lower outward; and the margins of which develop one or a greater number of buds, which are the ovules.

**355.** When the carpels are stalked, they are said to be seated upon a *thecaphore*, or *gynophore; Ex.* Cleome, Passiflora. Their stalk is analogous to the petiole of a leaf.

**355.** *a.* When the carpels are all distinct, or are separable with facility, they are *apocarpous;* when they all grow into a solid body, which cannot be separated into its constituent parts, they are *syncarpous.*

**356.** The ovary is the lamina of the leaf.

**357.** The style is an elongation of the midrib (174.)

**358.** The stigma is the denuded, secreting, humid apex of the midrib.

**359.** Where the margins of the folded leaf, out of which the carpel is formed, meet and unite, a copious development of cellular tissue takes place, forming what is called the *placenta.*

**360.** Every placenta is therefore composed of two parts, one of which belongs to one margin of the carpel, and one to the other.

**361.** As the carpels are modified leaves, they necessarily obey the laws of arrangement of leaves, and are therefore developed round a common axis.

**362.** And as they are leaves folded inward, their margins are necessarily turned towards the axis. The placenta, therefore, being formed by the union of those margins, will be invariably next the axis."

From this we learn, in few words, that the carpellary leaf is always so folded that its midrib is towards the circumference, or forms the dorsum of the cell or carpel, while the placentiferous margins are placed in the axis; that the difference between a one-celled and many-celled fruit, merely consists in the placentiferous margins of the carpellary leaves of the former not extending inward to the axis, but stopping in the circumference and bearing their ovules attached to the walls of the cell—hence *parietal.* This position of the carpellary

leaf is so constant, that the possibility of an inversion of this order of things in a pepo seems never to have entered into the calculations of any one of the numerous botanists who have given their attention to the investigation of the structure of this curious fruit; and yet such is simply the case. In a pepo the normal position of the midrib of the carpellary leaf is reversed, that is, is placed in the axis, and the placentiferous margins towards the circumference.* That such is actually the case requires no argument to prove it; we have only to cut the ovary of any true Cucurbitaceous plant to be made sensible, with a glance, that it is so; though I confess that in none have I seen it so clearly made out as in *Coccinia Indica*, owing to the carpels of that species remaining distinct; merely held together, not as usual by cohesion between the respective carpels, but by the tube of the calyx in which they are enclosed. Did I wish to illustrate the theory by means of a diagram, I could not devise one more perfect than a simple section of the ovary of that plant, merely extending the natural divisions, by dividing the calyx, so as to allow each of the carpels to be slightly separated in the representation, to facilitate the demonstration. This, however, I think is even unnecessary, for with the clew to the true structure, which this species furnishes, there can no longer be any difficulty in understanding it from the examination of any genuine species of the order.

What effect this new exposition of the structure of the ovarium may have on the determination of the affinities of this order, I am, up to the present time, quite unprepared to say; but of this I feel certain, that in so far as structure is concerned, they are as far removed from all their now reputed allies, as their peculiar habit removes them from all the Parietose families, except *Passifloræ*, among which Bartling, Endlicher and Lindley, have placed them. This very unusual structure, in short, marks them as a peculiar order, the affinities of which have still to be sought for.

* "This view is much the same as that advanced by Seringe sixteen years ago; but from which I still dissent."—ARNOTT.

I am equally unprepared to say to what extent this unlooked-for structure may influence our views in regard to other anomalous orders, especially those with solitary carpels, since, having established the fact that the usual structure may be inverted, it will naturally lead to new investigations, which may prove, that the solitary carpels of leguminosæ are not as now supposed, necessarily the result of constant abortion of one of two carpella, but may be explained on some other theory more consonant with the, almost invariably observed, structure in that large and interesting order; which, like Cucurbitaceæ, stands an isolated family in the system of plants, through this one remarkable peculiarity: a peculiarity so constant in this tribe, that it goes far to prove the existence of that botanical nonentity—a terminal leaf. But being unprepared to offer any matured opinions on these points, I forbear further speculation, trusting however, ere long, to be able to re-enter more at large on the consideration of this interesting inquiry.

MADRAS, *20th January*, 1841.

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## XXVII.—ENUMERATIO FILICUM PHILIPPINARUM; *or a Systematic Arrangement of the* FERNS *collected by* H. CUMING, ESQ., F.L.S., *in the Philippine Islands and the Peninsula of Malacca, between the years* 1836 *and* 1840. By J. SMITH, A.L.S.

HAVING obtained an early set of the splendid collection of Ferns brought from the Philippine Islands by Mr Cuming, I have examined and collated them with my general collection, and have drawn up a list of the species, noting their localities, and the number attached to each presumed species, as given out by Mr Cuming, thinking that such may be useful to those who have obtained similar sets.

In determining the species, I have carefully compared them with the descriptions and figures of authors, and also with specimens in my herbarium, which, besides containing many East Indian species, likewise contains a select-named collec-

tion from the islands of Java, Celebes, &c., presented to me by Professor Reinwardt of Leyden, many of which are identical with Mr Cuming's; and on looking at the labours of Horsfield, Reinwardt, and Blume, in these Islands, and Hænke in the Philippines, &c., we need not be surprised to find the greater part already known; and it is even highly probable that some which I have now given as new species, may, on further examination, and reference to specimens, prove to be previously described. Nevertheless, I trust the following enumeration will be found useful, and serve as a key to those who may be inclined to assist in clearing up any doubtful species.

The arrangement adopted is the same as given by me in a paper on the "genera of Ferns," which was read last year before the Linnean Society, and which in principle agrees with that of Presl, but differing on points as regards the value of characters and affinities and extent of some genera.

In the collection there are a few generic forms which I was not before sufficiently acquainted with, to warrant their adoption in my original paper; and in order that the following should be confined to a list of names, I have refrained from giving the characters of the new forms, as I intend to treat of them more at length in a separate paper, as an addendum to my original article. I have therefore only made a few observations on the new forms, as also on the peculiarities of a few of the species, brought about by difference of age and place of growth, and which, in my opinion, are not sufficiently attended to by many botanists.

Royal Botanic Garden, Kew,
*March 6th*, 1841.

## DIV. I. POLYPODIACEÆ, *R.B.*

TRIBE I. POLYPODIEÆ, *J. Sm.—Sori round, oblong or elongated, destitute of a special indusium.*

Sect. I. *Orthophlebieæ.*—Venation free; none of the venules anastomosing.

### MONOGRAMMA, *Schk.*

1. M. *trichoidea*, J. Sm.—Luzon; *Cuming;* (*n.* 160.)*

### GRAMMITIS, *Sw. J. Sm.*

2. G. *hirta*, Blume.—Luzon; (*n.* 222.)
3. G. *cucullata*, Blume.—Luzon; (*n.* 206.)

### POLYPODIUM, *Linn. R. Br.*

* *Ctenopteris*, Blume.

4. P. *sertularioides*, J. Sm.—Malacca; (*n.* 380.)
5. P. *obliquatum*, Blume.—Luzon; (*n.* 111.)
6. P. *nutans*, Blume.—Malacca; (*n.* 398.)
7. P. *subfalcatum*, Blume.—Luzon; (*n.* 205.)
8. P. *serræformis.*—Davallia serræformis, *Wall.; Hook.*—Luzon; (*n.* 261.)
9. P. *contiguum.*—Davallia contigua, *Sw.*—Luzon; (*n.* 216.)
10. P. *papillosum*, Blume.—Luzon; (*n.* 185.)

** *Phegopteris*, Presl.; J. Sm.

11. P. *recedens*, J. Sm.—Luzon; (*n.* 96.)
12. P. *asperulum*, J. Sm.—Luzon; (*n.* 63.)
13. P. *trichodes*, Reinw.—Luzon; (*n.* 1, 75, 412.)

*Obs.*—This agrees with *Polypodium ornatum* of Wallich, which is probably not distinct from *Polypodium rugulosum* of Labillardiere.

### GYMNOGRAMMA, *Desv.; J. Sm.*

14. G. *javanica*, Blume.—Luzon; (*n.* 86.)

*Obs.*—Tab. 41 and 42 of Blume's Flora Javæ certainly represent this plant, although they are given as two species,

* These Nos. were attached to the specimens when distributed.

and also different from Mr Cuming's specimens, in being represented as bipinnate.

NOTHOLÆNA, *R. Br.*

15. N. *densa*, J. Sm.—Luzon; (*n.* 282.)

Sect. II. *Symplophlebieæ.*—Venules variously anastomising or reticulated.

STENOSEMIA, *Presl.*

16. S. *aurita*, Presl.—Acrostichum auritum, *Sw.*—Polybotrya aurita, *Blume.*—Leyte; (*n.* 295, 302.) Samar; (*n.* 321.) Zebu; (*n.* 341.)

*Obs.*—This fern has hitherto been placed in the tribe *Acrostichieæ*, and Presl has characterized it as a distinct genus, differing from *Polybotrya* by its anastomosing venules; but on examining the specimens bearing the above numbers, it appears evident that all previous descriptions and figures of the fertile frond have been taken from starved or imperfectly developed plants, as exhibited by those numbered 295, and 341, which are characteristic of the tribe *Acrostichieæ*, whereas Nos. 302 and 321, are evidently the same in a more perfect state, the fertile fronds being but slightly contracted, and bearing round or oblong sori, and therefore characteristic of the tribe *Polypodieæ.* In some cases the venation of the fertile frond is free and bearing round sori, therefore not differing from that of *Polypodium*; but it is usual for the lower venules to anastomose, (as in the sterile frond,) and produce round or oblong sori, presenting some affinity with *Meniscium* and *Goniopteris.*

MENISCIUM, *Schreb.*

17. M. *triphyllum*, Sw.—Leyte; (*n.* 299.)

18. M. *cuspidatum*, Blume.—Luzon; (*n.* 178.) Leyte; (*n.* 314.) Mindora; (*n.* 361.)

GONIOPTERIS, *Presl.*

19. G. *rubida*, J. Sm.—Luzon; (*n.* 415.)

20. G. *prolifera*, Presl.—Meniscium proliferum, *Sw.*—Luzon; (*n.* 168.)

21. G. *aspera.*—Polypodium asperum, *Roxb. in herb. Linn. Soc.*—Luzon; (*n.* 172.)

GONIOPHLEBIUM, *Blume; J. Sm.; Presl.*

(Marginaria, *Presl.*)

22. G. *pallens?* Presl.—Polypodium, *Blume.*—Luzon; (*n.* 203.)

23. G. *subauriculatum?* Presl.—Polypodium, *Blume.*—Luzon; (*n.* 244.)

NIPHOBOLUS, *Kaulf.*

24. N. *nummularifolius.*—Acrostichum nummularifolium, *Sw.*; *Blume.*—Luzon; (*n.* 246.)

25. N. *varius*, Kaulf.; Blume; J. Sm.—Luzon; (*n.* 17, 67, 88, 93, 135, 240.) Corregidor; (*n.* 286.) Samar; (*n.* 323.)

*Obs.*—The synonymy of the species of this genus appears to me to be in a state of great confusion, which is in some measure owing to several authors having characterized two or more species, from the different forms common to one species only. I am led to believe that such has been the case on comparing the specimens bearing the above Nos. with one another, and with others in my collection, and although their extremes of form appear very different from each other, yet I cannot bring myself to consider them otherwise, than as mere variations of one species brought about by local circumstances attending their growth.

26. N. *acrostichoides*, J. Sm.—Luzon; (*n.* 127.)

27. N. *sphærocephalus, Hook. et Grev.*—Malacca; (*n.* 372.)

28. N. *splendens*, J. Sm.—Samar; (*n.* 331.)

DICTYOPTERIS, *Presl.*

29. D. *macrodonta*, Presl.—Polypodium macrodon, *Reinw.*—Polypodium confluens, *Wall.*—Luzon; (*n.* 9, 114.)

30. D. *pteroides*, Presl.—Polypodium pteroides, *Presl, reliq. Haenk.*—Luzon; (*n.* 171.)

DRYNARIA, *Bory; R. Br.; J. Sm.*
(Phymatodes, *Presl.*)
† *Phymatodes, J. Sm.*
* *Fronds simple.*

31. D. *cuspidiflora.*—Polypodium cuspidiflorum, *Reinw.*—Luzon; (*n.* 109.)

32. D. *stenophylla.*—Polypodium stenophyllum, *Blume.*—Luzon; (*n.* 122.)

** *Fronds pinnatifid.*

33. D. *vulgare*, J. Sm.—Polypodium phymatodes, *Linn.*—Luzon; (*n.* 27, 201.)

34. D. *palmata*—Polypodium, *Blume.*—Luzon; (*n.* 52, 126.)

35. D. *glauca*, J. Sm.—Luzon; (*n.* 124.)

36. D. *rubida*, J. Sm.—Luzon; (*n.* 241.)

37. D. *lomarioides*, J. Sm.—Luzon; (*n.* 242.)

*** *Fronds pinnate, pinnæ articulated with rachis.*

38. D. *albido-squamatum*—Polypodium albido-squamatum, *Blume.*—Polypodium cuspidatum, *Reinw.*—Luzon; (*n.* 202, 236.)

39. D. *diversifolia.*—Polypodium diversifolium, *R. Br.*—(*n.* 248, 263.)

†† *Phyllitidis, J. Sm.*

* *Fronds simple, rarely lobed.*

40. D. *neglecta.*—Polypodium neglectum, *Blume.*—Luzon; (*n.* 121.)

41. D. *rupestre.*—Polypodium rupestre, *Blume.*—Luzon; (*n.* 245.)

42. D. *tenuiloris*, J. Sm.—Mindanao; (*n.* 287.)

43. D. *undulata*, J. Sm.—Luzon; (*n.* 250.)

44. D. *longissima*, J. Sm.—Luzon; (*n.* 66.)

45. D. *subfalcata*, J. Sm.—Luzon; (*n.* 113.)

46. D. *dubia*, J. Sm.—Samar; (*n.* 324.)

*Obs.* The very great similarity of the four preceding species with *Drynaria longifrons*, (*Polypodium*, Wall,) and a

few other allied species, renders it difficult to determine their distinctive characters; and were it not for the very obvious difference exhibited by each in the branching and anastomosing of the veins, I should be inclined to view them only as so many different forms of one species.

47. D. *irioides.*—Polypodium irioides, *Poir.; R. Br.*—Luzon; (*n.* 21.)

††† *Dipteris, Reinw.*

* *Fronds bipartite, or palmate-digitate.*

48. D. *Horsfieldii,* R. Br.—Polypodium dipteris, *Blume.*—Dipteris conjugata, *Reinw.*—Luzon; (*n.* 155.)

** *Fronds pinnatifid, laciniæ articulated with the rachis.*

49. D. *quercifolia,* Bory.—Polypodium quercifolium, *Linn.*—Luzon; (*n.* 25, 273, 414.)

*Obs.* The long stipes and narrow laciniæ of the specimens marked "No. 414," afford a rather distinct specific character; but viewing it in conjunction with others in my collection, I cannot consider it more than as a form dependent upon local circumstances.

50. D. *morbillosa.*—Polypodium morbillosum, *Presl, Reliq. Haenk.*—Samar; (*n.* 330.)

51. D. *adfine.*—Polypodium adfine, *Reinw.*—Luzon; (*n.* 97.)

AGLAOMORPHA, *Schott.*

(Psygmium, *Presl.*)

52. A. *Meyeriana,* Schott.—Psygmium elegans, *Presl.*—Luzon; (*n.* 49.)

*Obs.* Although it appears probable that both Schott and Presl have drawn up their respective characters of this genus from the same specimen, yet they differ from each other, and from my own observations. This has no doubt arisen from the very obscure state of the fertile venules; but by careful examination it will be seen that the sporangia are not produced either on the apex of a free venule (as stated by Presl), or on the confluent apices of two venules (as stated by

Schott), but are produced on the confluence of several venules as in the preceding genus *Drynaria*, and differing only from *Drynaria quercifolia*, and *coronans*, by the upper and fertile portion of the frond being contracted into rachiform pinnæ, bearing a row of small round sori on each side of their midrib; and therefore *Aglaomorpha* is not so characteristic as a distinct genus, as its singular appearance would lead one to imagine.

### Dryostachium, *J. Sm.*

53. D. *splendens*, J. Sm.—Luzon; (*n.* 87.)

54. D. *pilosum*, J. Sm.—Luzon; (*n.* 90.)

*Obs.* What I have said with regard to the affinity of *Aglaomorpha* with *Drynaria quercifolia* and *coronans*, might with equal propriety be applied to the two species forming this genus; and the only reason that has induced me to separate them from *Aglaomorpha* is their very remarkable large amorphous-like sori; the formation of the receptacle being rather singular, especially as regards the first species; in the second the sporangia are pilose like *Drynaria crassifolia*.

### Lecanopteris, *Blume.*

55. L. *carnosa*, Blume.—Leyte; (*n.* 312.)

*Obs.* This appears to be a very rare fern, there being only four specimens in the collection.

### Selliguea, *Bory; Blume.*

56. S. *membranacea*, Blume.—Samar; (*n.* 325, 334.)

57. S. *macrophylla*, Blume.—Bohol; (*n.* 351.)

58. S. *flavescens.*—Grammitis flavescens, *Wall.*—Luzon; (*n.* 12.)

59. S. *pothifolia.*—Hemionitis pothifolia, *Ham.; D. Don.*—Grammitis decurrens, *Wall.; Hook.*—Luzon; (*n.* 53.) Samar; (*n.* 320.)

### Diblemma, *J. Sm.*

60. D. *Samarensis*, J. Sm.—Samar; (*n.* 332.)

*Obs.* This simple-looking fern has the venation of *Drynaria* and *Drymoglossum*, and is peculiar in having the simple

punctiform sori of *Drynaria* and the compound elongated marginal sorus of *Drymoglossum* on the same frond. This double character goes some length to confirm a former observation of mine, that the elongated transverse sori of *Taenitis* and its allies, as also the elongated oblique sori of *Selliguea*, are formed by a coalition or prolongation of soriferous points. Such a view proves the affinity of these genera with *Drynaria*.

TAENITIS, *Sw.*

61. T. *blechnoides*, Sw.—Guionaros; (*n.* 277.)

VITTARIA, *Sm.*

62. V. *ensiformis*, Sw.—Luzon; (*n.* 28, 76.)
63. V. *angustifolia*, Blume.—Malacca; (*n.* 381.)

ANTROPHYUM, *Kaulf.*

64. A. *semicostatum*, Blume.—Luzon; (*n.* 19.)
65. A. *latifolium*, Reinw.—Luzon; (*n.* 416.)
66. A. *obtusum*, Kaulf.—Luzon; (*n.* 81.)

*Obs.* The uniform smallness of the whole of the specimens of this No. is hardly characteristic of its being a distinct species, and probably it is only a small state of *Antrophyum reticulatum*.

HEMIONITIS, *Linn.*

67. H. *cordata*, Roxb.—Corregidor; (*n.* 285.)

CERATOPTERIS, *Brong.*

68. C. *thalictroides*, Brong.—Negros; (*n.* 344.)

Tribe II. ACROSTICHIEÆ, *Presl.—Sori amorphous, destitute of a special indusium.*

Sect. I. *Orthophlebieæ.*—Venation free, none of the venules anastomosing.

ELAPHOGLOSSUM, *Schott.*

(Olfersia, *Presl* in part.)

69. E. *Blumeanum*, J. Sm.—Acrostichum viscosum, *Blume. non Swartz.*—Luzon; (*n.* 194.)

70. E. *obtusifolium.*—Acrostichum obtusifolium, *Willd.; Blume.*—Acrostichum decurrens, *Blume.*—Luzon; (n. 144, 193.)

POLYBOTRYA. *Humb.; J. Sm.*

71. P. *serrulata*, J. Sm.—Luzon; (*n.* 47.)

72. P. *intermedia*, J. Sm.—Luzon; (*n.* 269.)

73. P. *apiifolia*, J. Sm.—Luzon; (*n.* 26.)

74. P. *articulata*, J. Sm.—Leyte; (*n.* 296.)

STENOCHLÆNA, *J. Sm.*

(Olfersia, *Presl* in part.)

75. S. *scandens.*—Acrostichum scandens, *Linn.*—*var.* α. Luzon; (*n.* 133.)—*var.* β. Luzon; (*n.* 226.)—*var.* γ. Negros; (*n.* 347.)

*Obs.* These varieties differ slightly in the base of the pinnæ being cordate in one, and elliptical in the others, and also in their margins being more or less undulate and serrated; but on comparing them with other specimens, I am inclined to consider them only as so many different forms of one species. This fern is (like many of its allies) epiphytal, the rhizoma creeping to a considerable height, and bearing the usual characteristic barren and fertile fronds, which are pinnate, and from two to three feet in length; but what renders this fern remarkable, is its producing a third kind of barren frond, so unlike the others, that, in the absence of good authority it would be difficult to believe they were the production of the same plant. These abnormal fronds are usually about three inches in length and tripinnatifid, not unlike some delicate multifid species of *Davallia* or *Cheilanthes;* they are found on lengthened rachis-like parts of the rhizoma, which are either smooth or aculeate. My first knowledge of this singular production was from a specimen sent me by Professor Reinwardt of Leyden in 1837, under the name of *Lomaria polymorpha* (*Lomaria aculeata*, Blume); and till now I concluded that some mistake had happened in labelling the specimens; but from Mr Cuming's authority and Reinwardt's specimen, there can be now no doubt that it is a pe-

culiar growth common to more than one species of this genus. I am not, however, in possession of sufficient evidence to enable me to say under what circumstances it takes place; although probably I am not far wrong in saying, that it may be considered as analogous to the Trichomanoid growth found on the stipes of *Hemitelia Capensis*.

76. S. *longifolia.*—Lomaria longifolia, *Kaulf.*—Luzon; (*n.* 143.)

*Obs.* The present specimens of this species appear to agree in every respect with specimens from Brazil, Jamaica, &c.

Sect. II. *Symplophlebieæ*, J. Sm.—Venules variously anastomosing, or reticulate.

LOMAGRAMMA, *J. Sm.*

77. L. *pteroides*, J. Sm.—Luzon; (*n.* 223.)

*Obs.*—The single species upon which this genus is founded has the habit of *Stenochlæna*, but differs in the venation being reticulate. It is distinct in habit from the following, and in the sporangia forming a broad marginal line or sorus; and therefore in that respect partaking of the character of *Lomaria*, but differing in having reticulate veins, and being without a special indusium.

ACROSTICHUM, *Linn.* (in part.)

78. A. *aureum*, Linn.—Corregidor; (*n.* 280.)

PLATYCERIUM, *Desv.; Blume.*

79. P. *biforme*, Desv.; Blume.—Luzon; (*n.* 156.)

80. P. *grande.*—Acrostichum grande, *A. Cunn.*—Luzon; (*n.* 157.)

*Obs.*—These two are very distinct. The latter seems not to differ from specimens collected at Moreton Bay by the late Mr Allan Cunningham.

CYRTOGONIUM, *J. Sm.*

(Pœcilopteris, *Presl.*—Campium, *Presl.*—Bolbitis, *Schott.* —Jenkinsia, *Hook.*)

81. C. *repandum*.—Acrostichum repandum, *Blume*.—Luzon; (*n*. 104.)

82. C. *diversifolium*.—Acrostichum diversifolium, *Blume*.—Luzon; (*n*. 32.)

83. C. *laciniatum*, J. Sm.—Leyte; (*n*. 294.)

84. C. *sinuosum*, J. Sm.—Luzon; (*n*. 105, 152.)

*Obs*.—The red colour of the rachis of No. 105 is slightly indicative of its being a distinct species from No. 152; but I am induced to consider them as one species, and also that No. 161 is probably a young state of the same.

PHOTINOPTERIS, *J. Sm.*

85. P. *simplex*, J. Sm.—Luzon; (*n*. 64.)

86. P. *Horsfieldii*, J. Sm.—Mindora; (*n*. 362.)

*Obs*.—My first knowledge of this singular fern was obtained from a specimen in the herbarium of Dr Horsfield, at the East India House. It differs from the following genus *Gymnopteris*, more by its peculiar and distinct habit, than by any obvious character in venation or disposition of the sporangia. It is probable that the first mentioned species will prove to be only an imperfect state of the second.

GYMNOPTERIS, *Presl; Bernh.*

87. G. *spicata*, Presl.—Acrostichum spicatum; *Linn*.—Hymenolepis ophioglossoides, *Kaulf*.—Luzon; (*n*. 92.)

88. G. *Platyrynchos*, J. Sm.—Luzon; (*n*. 196.)

89. G. *normale*, J. Sm.—Samar; (*n*. 326.)

90. G. *axillaris*, Presl.—Acrostichum axillaris, *Cav*.—Leptochilus axillaris, *Kaulf*.—Luzon; (*n*. 30.)

91. G. *taccæfolia*, J. Sm.—Mindora; (*n*. 357.)

92. G. *trilobatum*, J. Sm.—Luzon; (*n*. 5.)

93. G. *subrepanda*, J. Sm.—Luzon; (*n*. 225.)

*Obs*.—The sterile fronds given out with No. 183 belong to this species, the fertile frond being an aspudium.

Tribe III. PTERIDIEÆ, *J. Sm.—Sori round, or elongated and transverse, marginal or intramarginal, furnished with a special exteriorly attached lateral indusium.*

Sect. I. *Chilosoreæ,* J. Sm.—Sori marginal.

HYPOLEPIS, *Bernh.; Presl.*

94. H. *tenuifolia,* Bernh.—Lonchites tenuifolia, *Forst.*—Cheilanthes arborescens, *Sw.*—Luzon; (*n.* 118, 140, 233.)

95. H. *repens,* Presl.—Lonchites repens, *Linn.*—Cheilanthes repens, *Kaulf.*—Luzon; (*n.* 271.)

*Obs.*—The present specimens of these two species differ in no respect from specimens which I have from the West Indies, New Zealand, and Norfolk Island.

CHEILANTHES, *Sw.; J. Sm.*

96. C. *farinosa,* Kaulf.—Luzon; (*n.* 235.)

97. C. *tenuifolia,* Sw.—Luzon; (*n.* 62, 281, 408.)

CASSEBEERA, *Kaulf; J. Sm.*

(Allosorus, *Presl* in part.)

98. C. *pedata.*—Pteris pedata, *Linn.*—Luzon; (*n.* 260.)

*Obs.*—I have extended the character of this genus, so as to embrace the greater part of the old Adiantoid section of *Pteris;* for it appears to me that there is a unity of structure, between them and the two original species of *Cassebeera,* which renders their separation injudicious.

ADIANTUM, *Linn.*

99. A. *lunulatum,* Burm.; Willd.—Luzon; (*n.* 73.)

100. A. *caudatum,* Linn.—Mindanao; (*n.* 292.)

101. A. *hirsutum,* Bory; Willd.—Luzon; (*n.* 11.)

*Obs.*—This last is scarcely distinct as a species from the preceding.

102. A. *species.*—Luzon; (*n.* 55.)

The specimens are too young to enable me to determine the species.

DORYOPTERIS, *J. Sm.*

(*Litobrochia, Presl* in part.)

103. D. *Wallichii,* J. Sm.—Pteris, *Wall.*—Luzon; (*n.* 238.)

*Obs.*—I include under this genus *Pteris hastata, sagittifolia, collina* and *varians* of Raddi, and *Pteris palmata*, Willd. It is distinguished from *Litobrochia* of Presl by the palmate habit, coriaceous texture, and internal veins.

LITOBROCHIA, *Presl; J. Sm.*

104. L. *intermedia.*—Pteris intermedia, *Blume.*—Luzon; (*n.* 41.)

105. L. *aurita.*—Pteris aurita, *Reinw.; Blume.*—Luzon; (*n.* 192.)

*Obs.*—This last is scarcely distinct from *Pteris pallida* of Raddi, a native of Brazil.

PTERIS, *Linn.*

106. P. *opaca*, J. Sm.—Zebu; (*n.* 342.)

107. P. *longifolia*, Linn.—Luzon; (*n.* 6.)

108. P. *pellucida*, Presl.—Luzon; (*n.* 85.)

109. P. *tæniosa*, J. Sm.—Corregidor; (*n.* 283.)

*Obs.*—This is very like *Pteris stenophylla* of Hooker, but has a different aspect: the fertile frond does not obviously differ from the fertile of the preceding species, although it is difficult to reconcile it as the same, when the barren frond of *Pteris pellucida* is examined with it.

110. P. *heterodactyla*, Reinw.—Luzon; (*n.* 45.)

111. P. *propinqua*, J. Sm.—Luzon; (*n.* 409.)

112. P. *crenata*, Sw.—Luzon; (*n.* 46.)

113. P. *semipinnata*, Linn.—Pteris dimidiata, *Blume.*—Luzon; (*n.* 258.)

114. P. *distans*, J. Sm.—Luzon; (*n.* 410.)

115. P. *asperula*, J. Sm.—*var.* α.; *ecaudata.*—Luzon; (*n.* 413.)—*var.* β. *caudata.*—Luzon; (*n.* 253.)

116. P. *Presliana*, Agardh.—Pteris attenuata, *Presl*, non *Sw.*—Luzon; (*n.* 69.)

117. P. *decussata*, J. Sm.—Luzon; (*n.* 103.?)

118. P. *spinescens*, Presl.—Luzon; (*n.* 79.)

119. P. *connexa*, J. Sm.—Luzon; (*n.* 204.)

120. P. *pellucens*, Agardh.—Luzon; (*n.* 8.)

121. P. *lanuginosa*, Bory.—Luzon; (*n.* 24, 100.) Bohol; (*n.* 353.)

*Obs.*—Scarcely distinct from *Pteris aquilina*, Linn.

### Onychium, *Kaulf.*

(Leptostegia, *D. Don.*)

122. O. *auratum*, *Kaulf.*—Lomaria aurea, *Wall.*

*Obs.*—The present specimens are deficient in the fine golden colour which usually characterizes this fern, but which is owing probably to a superabundance of moisture.

Sect. II. *Metasoreæ.*—Sori, intramarginal or costal.

### Lomaria, *Willd.*

123. L. (Specimens not perfect.)—Luzon; (*n.* 200.)

124. L. *vestita*, Blume.—Lomaria aurita, *Reinw.*—Luzon; (*n.* 141.)

*Obs.* This does not appear to differ from *Lomaria Chilensis* of Kaulf., or *Lomaria ornifolia* of Presl.

### Blechnum, *Linn.*

125. B. *nitidum*, Presl, (*exclus. syn. Desv.*)—Luzon; (*n.* 164.)

126. B. *striatum*, R. Br.—Malacca; (*n.* 385.)

127. B. *orientale*, Linn.—Luzon; (*n.* 166, 257.)

128. B. *Finlaysonianum*, Wall.; Hook.—Malacca; (*n.* 370.)

## Tribe IV. Asplenieæ.—*Sori, elongated, oblique, furnished with a special lateral indusium.*

Sect. I. *Orthophlebieæ.*—Venation free, none of the venules anastomosing.

### Scolopendrium, *Sm.*

129. S. *pinnatum*, J. Sm.—Luzon; (*n.* 187). Leyte; (*n.* 311.)

DIPLAZIUM, *Sw.; Presl.*

130. D. *porrectum.*—Asplenium porrectum, *Wall.*—Malacca; (*n.* 387.)

131. D. *deflexum*, J. Sm.—Malacca; (*n.* 386.)

132. D. *Sorzogonense*, Presl.—Leyte; (*n.* 301.)

*Obs.* The paleaceous rachis is the chief character that distinguishes this from *Diplazium striatum*, a native of the West Indies, which with the present, and some other nearly related species, present different forms, according to the difference of age or size of the fronds from which the specimens are taken, and which circumstance has evidently led to the creating of more than one species from the same plant; for it has been observed that the fronds of young plants are, for a certain period only, pinnate, and yet appear perfect by being soriferous, although at a subsequent period the same plant will be found producing bipinnate or tripinnate fronds, five or six feet in length; thus one of the ultimate pinnæ of such a frond is analogous to the whole frond in the early or nascent condition of the plant. I have considered it necessary to notice this on account of my having in the present enumeration placed two or more very different looking specimens under the same name.

133. D. *Schkuhrii*, J. Sm.—Asplenium ambiguum, *Schk. Crypt. t.* 75. *a.* non Swartz, neque Raddi.—Malacca; (*n.* 389.)

*Obs.* Schkuhr has figured two distinct plants for the *Asplenium ambiguum* of Swartz; the one is the present species, and the other (*t.* 75. *b.*) is *Callipteris Malabarica* of this enumeration.

134. D. *affine*, J. Sm.—Luzon; (*n.* 167.)

135. D. *extensum*, J. Sm.—Luzon; (*n.* 170, 199.) Samar; (*n.* 333, 336); Bohol; (*n.* 349); Malacca; (*n.* 388.)

*Obs.* The specimens numbered No. 199, 333, and 338, are not unlike *Diplazium grandifolium* from the West Indies, but I consider them different, and that they are young plants of the species which produces the large bipinnate fronds, numbered 170, 336, and 349.

136. D. *ebenum*, J. Sm.—Luzon; (*n*. 29, 159.)

137. D. *frondosum*.—Asplenium frondosum, *Wall.*—Luzon; (*n*. 20, 288? imperfect)

138. D. *caudatum*, J. Sm.—Luzon; (*n*. 158.)

139. D. *brevisorum*, J. Sm.—Luzon; (*n*. 153.)

*Obs.* The specimens No. 56, are probably one of the above species in a young state.

ASPLENIUM, *Linn.; J. Sm.*

* PHYLLITIDIS.

140. A. *vittæforme*, Cav.—Luzon; (*n*. 106, 308.)

141. A. *scolopendrioides*, J. Sm.—Leyte; (*n*. 318.)

** SALICINEÆ.

142. A. *prionurus*, J. Sm.—Luzon; (*n*. 197.)

143. A. *salicinum*, J. Sm.—Bohol; (*n*. 348.)

144. A. *persicifolium*, J. Sm.—Luzon; (*n*. 125.)

145. A. *calophyllum*, J. Sm.—Luzon; (*n*. 188.)

146. A. *longissimum*, Reinw.—Malacca; (*n*. 373.)

*** TRICHOMANEÆ.

147. A. *resectum*, Sm.—Luzon; (*n*. 40, 110.)

148. A. *elongatum*, Sw.—Luzon; (*n*. 163.)

*** DAREÆ.

149. A. *scandens*, J. Sm.—Leyte; (*n*. 297.)

**** ACROPTEREÆ.

150. A. *platyphyllum*, J. Sm.—Malacca; (*n*. 375.)

151. A. *oxyphyllum*, J. Sm.—Luzon; (*n*. 42.)

152. A. *pellucidum*, Lam.—Luzon; (*n*. 147.)

153. A. *caudatum*, Forst.—Luzon; (*n*. 99, 128.)

154. A. *lepturus*, J. Sm.—Luzon; (*n*. 211.)

155. A. *varians*, Wall.—Luzon; (*n*. 54.)

156. A. *spathulinum*, J. Sm.—Luzon; (*n*. 210.)

157. A. *laserpitiifolium*, Lam.—Asplenium angustatum, *Reinw.*—Luzon; (*n*. 43.)

Sect. II. *Symplophlebieæ.*—Venules variously anastomosing, or reticulate.

NEOTTOPTERIS, *J. Sm.*

158. N. *vulgaris,* J. Sm.—Asplenium Nidus, *Linn.*—Luzon; (*n.* 15.)

159. N. *musæfolia,* J. Sm.—Luzon; (*n.* 89.)

160. N. *Phyllitidis.*—Asplenium Phyllitidis, *D. Don.*—Samar; (*n.* 319.)

161. N. *stipitata,* J. Sm.—Luzon; (*n.* 195.)

*Obs.* The very distinct aspect, size, and texture of the above specimens have induced me to consider them distinct species. The genus is distinguished from the rest of *Asplenieæ* by the venules terminating in a transverse marginal vein or border.

CALLIPTERIS, *Bory; J. Sm.*

(Anisogonium, *Presl.*—Digrammaria, *Presl.*—Oxygonium, *Presl.*—Camptosorus, *Link; Presl.*)

162. C. *vittæformis,* J. Sm.—Samar; (*n.* 329.)

163. C. *ovata.*—Diplazium ovatum, *Wall.*—Leyte; (*n.* 307.)

164. C. *alismæfolia.*—Diplazium alismæfolium, *Presl Reliq. Hænk.*—Luzon; (*n.* 116.)

*Obs.* This and the preceding species produce simple and pinnate fronds on the same plant; and, what is rather singular, the pinnate form does not appear to have been before noticed, as both species are merely described from the simple state, hence the names are not now very applicable.

165. C. *elegans,* J. Sm.—Luzon; (*n.* 276.) Leyte; (*n.* 305.)

166. C. *spinulosa.*—Diplazium spinulosum, *Blume.*—Leyte; (*n.* 303.)

167. C. *malabarica.*—Diplazium malabaricum, *Spreng.*—Asplenium ambiguum, *Sw.; Willd.; Schk. Crypt. t.* 75.—Luzon; (*n.* 35.)

Tribe V. Aspidieæ.—*Sori intramarginal, punctiform, or rarely oblong, furnished with a special indusium, which is either peltate, or lateral and interiorly attached.*

Sect. I. *Symplophlebieæ.*—Venules variously anastomosing.

Matonia, *R. Br.*

168. M. *pectinata*, R. Br.—Mount Ophir, Malacca; (*n.* 383.)

Aspidium, *Schott.*

169. A. *Singaporianum*, Wall.—Malacca; (*n.* 403.)

170. A. *decurrens*, Presl.—Luzon; (*n.* 148.)

171. A. *alatum*, Wall.; Hook.—Panay; (*n.* 356.)

172. A. *grande*, J. Sm.

*Obs.* At the time of distribution, this was thought to be the same as the preceding, but it is certainly distinct.

173. A. *repandum*, Willd.—Luzon; (*n.* 183, in part.)

174. A. *latifolium.*—Polypodium latifolium, *Forst.; Schk. Crypt. t.* 24.—Luzon; (*n.* 57.)

175. A.? *irriguum*, J. Sm.—Luzon; (*n.* 31, specimens not perfect.)

Sagenia, *Presl.*

176. S. *plataphylla*, J. Sm.—Luzon; (*n.* 224) Mindanao; (*n.* 290.) Zebu; (*n.* 339, 340.)

*Obs.* The specimens numbered 340, agree in every respect with the broad sterile fronds of the other cited numbers, but differing in being fertile, and in the venation and position of the sori being more characteristic of the genus *Aspidium* than of *Sagenia*, a circumstance which tends to prove that venation is often changeable in the same species according to the more or less contracted state of the frond.

177. S. *intermedia*, J. Sm.

*Obs.* When distributed, this was supposed to be the same as No. 9 of Cuming, which is No. 29 of this enumeration. It is scarcely distinct from *Aspidium* (*Sagenia*) *coadunatum*, Wall., and *Aspidium* (*Sagenia*) *hippocrepis*, Sw.

178. S. *calcarea*, (J. Sm.)—Leyte; (*n.* 310.)

*Obs.* This number probably consists merely of imperfect specimens of the preceding, having been gathered from plants growing within the influence of moist limestone rocks.

PLEOCNEMIA, *Presl.*

179. P. *Leuceana,* Presl.—Polypodium Leuceanum, *Gaud.* —Luzon; (*n.* 33, 34, 107.) Mindanao; (*n.* 289).

*Obs.* The tribe *Aspidieæ* being distinguished from *Polypodieæ* by the sori always having a special indusium, and it having been observed that this organ is often very fugacious or so small as to become soon obliterated by the enlargement of the sporangia, and as both *Aspidieæ* and *Polypodieæ* contain genera quite analogous in habit, venation, and position of the sori, it therefore becomes difficult in the absence of the indusium, to determine in which tribe those species so circumstanced should be placed. Indeed, from my own observations, it appears probable that many species described as belonging to *Polypodieæ,* are true *Aspidieæ,* as is the case with the present, and likewise with some species of the following genera.

NEPHRODIUM, *Schott; Presl.*

(Cyclodium, *Presl.*)

180. N. *Blumei,* J. Sm.—Gymnogramma canescens, *Blume.* —Goniopteris canescens, *Presl.*—Samar; (*n.* 322.)

181. N. *simplicifolium,* J. Sm.—Leyte; (*n.* 315.)

182. N. *acrostichoides,* J. Sm.—Luzon; (*n.* 149.)

183. N. *glandulosum.*—Aspidium glandulosum, *Blume.* —Luzon; (*n.* 16.) Leyte; (*n.* 298.)

184. N. *caudiculatum,* Presl.—Aspidium, sp., *Sieb.*—Luzon; (*n.* 10, 84.) Leyte; (*n.* 317.) Zebu; (*n.* 338.)

185. N. *unitum,* R. Br.—Luzon; (*n.* 259.)

186. N. *Cumingii,* J. Sm.—Mindanao; (*n.* 293.) Malacca; (*n.* 391.)

187. N. *abruptum,* J. Sm.—Luzon; (*n.* 120.)

188. N. *canescens,* Presl.—Aspidium canescens, *Wall.*—Luzon; (*n.* 254.)

189. N. *hirsutum*, J. Sm.—Luzon; (*n.* 82.)

190. N. *mucronatum*, J. Sm.—Luzon; (*n.* 182, 268, 278, 279.)

191. N. *molle*, R. Br.—Luzon; (*n.* 83.)

Sect. II. *Orthophlebieæ.*—Venation free, (none of the venules anastomosing.)

LASTREA, *Presl.*

192. L. *Presliana*, J. Sm.—Nephrodium semicordatum, *Presl* (*exclus. syn. Sw. Willd.*)

*Obs.* The *Aspidium semicordatum* of Swartz is a native of the West Indies, with which the present species agrees in habit, but differs in having the sori situated on the middle of the venules (hence are *lateral*); whereas in the West Indian species the sori are situated on their apex or are *terminal.*

193. L. *lata*, J. Sm.—Luzon; (*n.* 266.)

194. L. *similis*, J. Sm.—Malacca; (*n.* 390.)

*Obs.* This is perhaps not different from the preceding, and they are scarcely to be recognised from *Aspidium falciculatum* of Raddi, a native of Brazil.

195. L. *attenuata*, J. Sm.—Samar; (*n.* 327.)

196. L. *verrucosa*, J. Sm.—Luzon; (*n.* 72.)

197. L. *ligulata*, J. Sm.—Luzon; (*n.* 74.) Zebu; (*n.* 343.)

198. L. *exigua*, J. Sm.—Luzon; (*n.* 251, 272.)

199. L. *viscosa*, J. Sm.—Malacca; (*n.* 401.)

200. L. *membranifolia*, Presl.—Luzon; (*n.* 36, 249.)

201. L. *propinqua*, J. Sm.—Luzon; (*n.* 80, 151, 252, 255.)

202. L. *spectabilis*.—Aspidium spectabile, *Blume.*—Luzon; (*n.* 13, 14, 154.) Bohol; (*n.* 354.)

POLYSTICHUM, *Schott.*

203. P. *rhomboideum*, Schott.—Aspidium rhomboideum, *Wall.*—Luzon; (*n.* 131.)

204. P. *obtusum*, J. Sm.—Luzon; (*n.* 234.)

*Obs.* This is rather a doubtful species, as probably specimens from older plants will exhibit a different character.

205. P. *discretum*.—Aspidium discretum, *Don.*—Luzon; (*n.* 181.)

206. P. *coniifolium*, Presl.—Aspidium coniifolium, *Wall.*—Luzon; (*n.* 262.)

*Obs.* The present specimens nearly agree with a species from Jamaica, which I conceive to be the *Aspidium denticulatum* of Swartz.

DIDYMOCHLÆNA, *Desv.*

207. D. *sinuosa*, Desv.—Luzon; (*n.* 142.)

*Obs.* This is certainly not distinct from the Brazilian plant.

NEPHROLEPIS, *Schott.*

208. N. *biserrata*, Schott.—Aspidium biserratum, *Sw.*—Luzon; (*n.* 22.) Mindanao; (*n.* 291.)

209. N. *hirsutula*, Presl.—Aspidium hirsutulum, *Sw.*—Luzon; (*n.* 23.) Malacca; (*n.* 407.)

210. N. *volubilis*, J. Sm.—Luzon; (*n.* 37.) Negros; (*n.* 346.)

*Obs.* No. 37 differs only from the preceding species in being smooth, and No. 346 appears to be the same, produced from the climbing stoloniferous rhizoma which is characteristic of the genus, and which is often seen well exemplified by an old inhabitant of our stores, viz., the *Nephrolepis exaltata.*

211. N. *tuberosa*, Presl.—Aspidium tuberosum, *Bory.*—Luzon; (*n.* 213.)

212. N. *trichomanoides*, J. Sm.—Luzon; (*n.* 101.)

*Obs.* This is closely allied to *Nephrodium* (*Nephrolepis*) *obliteratum*, R. Br.

OLEANDRA, *Cav.*

(Neuronia, *D. Don.*)

213. O. *Cumingii*, J. Sm.—Luzon; (*n.* 60.)

*Obs.* I once considered this fern to be the *Aspidium Wallichii* of Hooker, (now *Oleandra*,) a native of Nepal, but on again examining them, I find they differ in the following points. In the Nepal plant the frond terminates with an

abrupt attenuated acumen, the sori are close to the midrib, and the articulated joint of the stipes is at its base close to the rhizoma. Iu the present specimens the apex of the frond is rather obtuse, the sori are at some distance from the midrib, and the articulation of the stipes is regularly a fourth of an inch or more from its base. I am therefore induced to consider these differences as constituting specific distinctions.

214. O. *neriiformis*, Cav.—Aspidium neriiforme, *Sw.*—Ophiopteris verticillata, *Reinw.*—Luzon; (*n.* 94.)

*Obs.* This is quite a distinct species from either the preceding or the species from Nepal, which have creeping epiphytal rhizomas; whereas the rhizoma or caudex of this species is erect, about half an inch in diameter and hollow; it is from four to six feet high, producing the fronds in verticillate terminal tufts on lateral branches. It inhabits open places growing in groups.

Tribe VI. Dicksonieæ.—*Sori marginal, round, globose or elongated, furnished with a special interior attached lateral indusium, which connives more or less with the indusiæform margin of the frond, and forms with it a calyciform or bivalved cyst or marginal groove.*

### Sect. I. *Lindsææ*, J. Sm.

### Isoloma, *J. Sm.*

215. I. *divergens.*—Lindsæa divergens, *Hook. et Grev.*—Vittaria, *Wall.*—Malacca; (*n.* 395.)

*Obs.* Besides the above species this genus also includes the *Lindsæa lanuginosa* of Wallich. It is distinguished from *Schizoloma* by its free venation, and from *Lindsæa* by having a central costa, and bearing sori equally on both margins.

### Schizoloma, *Gaud.*

216. S. *ensifolia.*—Lindsæa ensifolia, *Sw.*—Pteris angustata, *Wall.*—Pteris angulata, *Presl.*—Malacca; (*n.* 369.)

217. S. *heterophylla.*—Lindsæa heterophylla, *Dry.*—Luzon; (*n.* 275.)

## LINDSÆA, *Dry.*

218. L. *oblongifolia*, Reinw.—Luzon; (*n.* 186.)
219. L. *cultrata*, Sw.—Luzon; (*n.* 65, 243.)
220. L. *concinna*, J. Sm.—Luzon; (*n.* 198.)

*Obs.* This is very like *Lindsæa elegans*, Hook., but it is not so rigid in habit.

221. L. *adantioides*, J. Sm.—Luzon; (*n.* 176.)
222. L. *rigida*, J. Sm.—Malacca; (*n.* 397.)

*Obs.* Allied to *Lindsæa stricta*, Dry., but differing in the pinnules being dentate.

223. L. *decomposita*, Willd.; Wall.—Malacca; (*n.* 393, 404.) Leyte? (*n.* 306.)

*Obs.* Although No. 404 is only simply pinnate, I do not hesitate considering it the young state of the bipinnate fronds of No. 393, which again is scarcely distinct from the West Indian *Lindsæa trapeziformis*, except that the stipes of the latter are (when dry) quadrangular, whereas in the present species they are semiterete.

224. L. *tenera*, Dry.—Malacca; (*n.* 399.)

*Obs.* This is scarcely different from a species from Venezuela.

## SYNAPHLEBIUM, *J. Sm.*

225. S. *recurvatum*.—Lindsæa recurvata, *Blume*.—Lindsæa nitens, *Reinw.*—Lindsæa serpens, *Wall.*—Malacca; (*n.* 392.)
226. S. *obtusum*, J. Sm.—Malacca; (*n.* 394.)

*Obs.* These two species, and also *Lindsæa pectinata*, Reinw., and *Lindsæa lobulosa*, Wall., constitute this genus, which is distinguished from *Lindsæa* by the venules anastomosing, and from *Schizoloma* by the midrib being excentric as in *Lindsæa*.

## ODONTOLOMA, *J. Sm.*

227. O. *pulchella*, J. Sm.—Luzon; (*n.* 217).
228. O. *Boryana*.—Davallia Boryana, *Presl Reliq. Hænk.*—Luzon; (*n.* 50.)
229. O. *tenuifolia*.—Lindsæa tenuifolia, *Reinw.*—Leyte; (*n.* 309.)

*Obs.* These species agree in habit and venation with *Lindsæa*, but differ in having punctiform (round) sori.

Sect. II. *Davallieæ*, J. Sm.

HUMATA, *Cav.*

230. H. *angustata.*—Davallia angustata, *Wall.*—Singapore; (*n.* 367.)

231. H. *heterophylla.*—Davallia heterophylla, *Sm.*—Davallia lobulosa, *Wall.*—Samar; (*n.* 335.)

232. H. *pedata.*—Davallia pedata, *Sm.*—Davallia cordifolia, *Reinw.*—Davallia subimbricata, *Blume.*—Samar; (*n.* 138.)

233. H. *pectinata.*—Davallia pectinata, *Sm.*—Luzon; (*n.* 61.)

LEUCOSTEGIA, *Presl; J. Sm.*

234. L. *hirsuta*, J. Sm.—Luzon; (*n.* 174.)

235. L. *falcinella.*—Davallia falcinella, *Presl.*—Leyte; (*n.* 304.)

236. L. *affinis*, J. Sm.—Luzon; (*n.* 117, 215.)

MICROLEPIA. *Presl; J. Sm.*

237. M. *pinnata.*—Davallia pinnata, Cav.—Davallia flagellifera, *Wall.*—Luzon; (*n.* 139.)

238. M. *alata.*—Davallia alata, *Hew.*—Luzon; (*n.* 119.)

*Obs.* This appears to agree in every respect with a Jamaica fern lately described in the *Magazine of Natural History*, by Mr Robert Heward, F.L.S.

239. M. *cristata*, J. Sm.—Luzon; (*n.* 95.)

240. M. *trichosticha*, J. Sm.—Samar; (*n.* 328.)

241. M. *rhomboidea*, Presl.—Davallia rhomboidea, *Wall.*—Luzon; (*n.* 7.)

*Obs.* This is probably not distinct from *Davallia flaccida*, R. Br., which is a species having an extensive range.

DAVALLIA, *Sm.; Presl; J. Sm.*

(Stenolobus, *Presl.*)

242. D. *pentaphylla*, Blume; Reinw.—Singapore; (*n.* 366.)

243. D. *alata*, J. Sm.—Bohol; (*n*. 350.)

244. D. *solida*, Sw.—Luzon; (*n*. 78.)

245. D. *elegans*, Sw.—Luzon; (*n*. 77.)

246. D. *retusa*, Willd.—Luzon; (*n*. 411.)

247. D. *tenuifolia*, Sw.—Luzon; (*n*. 59.)

### Sect. III.—*Trichomaneæ*, J. Sm.

#### TRICHOMANES, *Linn.*

##### * CÆSPITOSEÆ.

248. T. *rhomboideum*, J. Sm.—Luzon; (*n*. 169.)

249. T. *curvatum*, J. Sm.—Luzon; (*n*. 184.)

*Obs.* This and the preceding species are closely allied to *Trichomanes javanicum* of Blume.

250. T. *achillæfolium*, Willd.—Luzon; (*n*. 162, 274.) Mindora; (*n*. 368.)

251. T. *obscurum*, Blume.—Luzon; (*n*. 134? 189.)

*Obs.* This is probably not distinct from *Trichomanes fœniculaceum*, of Bory.

252. T. *gemmatum*, J. Sm.—Malacca; (*n*. 400.)

253. T. *meifolium*, Bory.—Luzon; (*n*. 137, 190, 207.)

##### ** REPENTEÆ.

254. T. *parvulum*, Poir.—Luzon; (*n*. 256.)

255. T. *angustatum*, Carm.—Luzon; (*n*. 208.) Mindora; (*n*. 358.)

256. T. *humile*, Forst.—Luzon; (*n*. 98.)

257. T. *bilingue*, Hook.—Luzon; (*n*. 2.) Leyte; (*n*. 316.)

258. T. *fusco-glaucescens*, Hook.—Luzon; (*n*. 219.)

259. T. *aculeatum*, J. Sm.—Luzon; (*n*. 146.)

260. T. *dissectum*, J. Sm.—Luzon; (*n*. 129.)

*Obs.* This species is similar in habit to *Trichomanes auriculatum* of Blume, but differs in the pinnæ being deeply laciniated.

261. T. sp.—Luzon; (*n*. 150, 209.)

*Obs.* Allied to *T. pyxidiferum*, Linn. The specimens are bad.

### HYMENOPHYLLUM, *Sm.*

262. H. *bivalve*, Forst.—Luzon; (*n.* 221, 264.)

263. H. *fimbriatum*, J. Sm.—Luzon; (*n.* 218.)

*Obs.* Very like *Hymenophyllum flexuosum* of A. Cunningham, from New Zealand, but differs in the margin of the indusium being fimbriate.

264. H. *sanguiolentum*, Sw.—Luzon; (*n.* 129, 220.)

265. H. *nitens*, R. Br.—Luzon; (*n.* 212.)

266. H. *dilatatum*, Sw.—Luzon; (*n.* 112.)

*Obs.* The specimens of the above species are certainly not specifically distinct from New Zealand specimens.

## Sect. IV. *Dicksoniæ*, J. Sm.

### SITOLOBIUM, *Desv.*

(Dicksonia, *Presl, non L'Heritier.*—Patania, *Presl.*)

267. S. *flaccidum.*—Dicksonia flaccida, *Sw.*—Luzon; (*n.* 108, 145, 232.)

268. S. *cuneatum*, J. Sm.—Luzon; (*n.* 231.)

*Obs.* I also place in this genus *Dicksonia glutinosa*, Wall., *Dicksonia pilosiuscula*, Willd., *Dicksonia dissecta*, Sw., *Dicksonia adiantoides*, Humb., and some other species.

### CIBOTIUM, *Kaulf.*; *J. Sm.*

269. C. *glaucum.*—Dicksonia glauca, *Sm. in Rees' Cyclop. and Herb. Linn. Soc.*—Luzon; (*n.* 123.)

*Obs.* This is probably scarcely distinct from the fern cultivated in our gardens under the name of "*Polypodium Baromez*," which is understood to be a native of China; and according to the fertile specimen which I have seen, the sori appear, as in the present specimens, to be solitary on each side of the base of the laciniæ forming a row on each side of the midrib of the pinnæ, in that respect differing from an allied species from Mexico (*Cibotium Schiedei*) which has the sori seated round the margin of the laciniæ.

Tribe VII. Cyatheæ, *J. Sm.—Sori intramarginal, punctiform-globose, furnished with a calyciform or lateral and interior attached special indusium, rarely naked, often furnished with articulated hairs, which involve the sporangia; receptacle elevated, globose or columnar; sporangia usually compressed.*

Schizocænea, *J. Sm.*

270. S. *Brunonis*, J. Sm.; Hook. et Bauer's gen. fil. t. 2. —Malacca; (*n.* 378.)

Cyathea, *Sm.; J. Sm.*

271. C. *integra*, J. Sm.—Luzon; (*n.* 120.)

272. C. *petiolata*, J. Sm.—Mindora; (*n.* 359.)

*Obs.* I possess specimens similar to this from New Ireland, and also from Jamaica.

Alsophila, *R. Br.*

273. A. *extensa*, R. Br.—Luzon; (*n.* 179.)

274. A. *caudata*, J. Sm.—Luzon; (*n.* 267.)

*Obs.* This species is probably not different from *Alsophila lunulata*, R. Br.

275. A. *glauca*, J. Sm.—Polypodium contaminans, *Wall.?* —Luzon; (*n.* 71, 191.) Negros; (*n.* 345.)

276. A. *lepifera*, J. Sm.—Luzon; (*n.* 180.)

Gymnosphæra, *Blume.*

277. G. *squamulata*, Blume.—Malacca; (*n.* 396.)

Div. II. Gleicheniaceæ, *R. Br.*

Gleichenia, *Sm.*

278. G. *semivestita*, Labill.—Gleichenia vulcanicum, *Blume.* —Gleichenia hecistophylla, *A. Cun.*—Malacca; (*n.* 402.)

*Obs.* This is evidently the same as Cunningham's New Zealand plant.

279. G. *Hermanni*, R. Br.—Luzon; (*n.* 270.)

280. G. *mucronata*, Reinw.—Mindora; (*n.* 374.)

281. G. *bifurcata*, Blume.—Malacca; (*n.* 377.)

282. G. *rigida*, J. Sm.—Luzon; (*n.* 136.)

283. G. *excelsa*, J. Sm.—Luzon; (*n.* 256.)

*Obs.* This agrees with specimens from the Sandwich islands, and which I once considered to be the *Gleichenia gigantea* of Wallich, but which now appears to be specifically distinct from the present specimens as well as from the Sandwich islands' specimens.

## Div. III. Osmundaceæ, *R. Br.*

### Osmunda, *Linn.*

284. O. *Presliana*, J. Sm.—Nephrodium banksiæfolium, *Presl Reliq. Hænk.*—Asplenium aureum, *Blume.; Reinw.*—Plenasium banksiæfolium, *Presl, Pteridographia.*—Nephrodium? bromeliæfolium, *Presl Reliq. Hænk.*—Plenasium? bromeliæfolium, *Presl, pteridog.*—Luzon; (*n.* 165.)

*Obs.* It was with much doubt that I admitted the genus *Plenasium* of Presl into my original paper on the Genera of Ferns, having seen only barren specimens of *Nephrodium? banksiæfolium* and *bromeliæfolium* of Presl, and also a barren specimen from Reinwardt of the *Asplenium aureum* of Blume; which last, as also *Asplenium Grammitis* of Wallich, is quoted by Presl as synonyms to one of his species of *Plenasium*. I have not been able to find "*Asplenium Grammitis*" in Wallich's herbarium at the Linnean Society: I am therefore at a loss to know what has led Presl to characterize this fern as a genus belonging to *Asplenieæ*; for it is evident that his two species are one, and the same as the barren portion of the frond of this *Osmunda!* which, as a species, is closely allied to *Osmunda javanica* of Blume, and *Osmunda Vachellii* of Hook. Ic. Pl. t. 15.

### Schizæa, *Sm.*

285. S. *digitata*, Sm.—Malacca; (*n.* 371.)

286. S. *propinqua*, A. Cunn.—Malacca; (*n.* 379.)

*Obs.* This No. agrees with Cunningham's New Zealand

specimens, and which are scarcely distinct from *Schizæa rupestris* of R. Br. from New South Wales.

LYGODIUM, *Sw.*

287. L. *circinatum*, Sw.—Luzon; (*n.* 70, 417.)

288. L. *microphyllum*, R. Br.—Luzon; (*n.* 44.) Leyte; (*n.* 300.)

289. L. *scandens.*—Ophioglossum scandens; *Linn.*—Samar; (*n.* 337.) Singapore; (*n.* 364, 365.)

### DIV. IV. MARATTIACEÆ, *Kaulf.*

ANGIOPTERIS, *Hoffm.*

290. A. *evecta*, Hoffm; Willd.—Luzon; (*n.* 18.)

MARATTIA, *Sm.*

291. M. *attenuata*, Labill.—Luzon; (*n.* 177.)

KAULFUSSIA, *Blume.*

292. K. *æsculifolia*, Blume.—Leyte; (*n.* 313.)

### DIV. V. OPHIOGLOSSEÆ, *R. Br.*

HELMINTHOSTACHYS, *Kaulf.*

293. H. *dulcis*, Kaulf.—Luzon; (*n.* 39.)

OPHIOGLOSSUM, *Linn.*

294. O. *reticulatum*, Linn.—Corregidor; (*n.* 284.)

295. O. *pendulum*, *Linn.*—Luzon; (*n.* 91.)

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### CORRIGENDA ET ADDENDA.

*After* 32, *p.* 397, *add*

32. *a.* D. *revoluta*, J. Sm.—Luzon; (*n.* 247.)

*After* 47, *p.* 48, *add*

** *Fronds pinnate.*

47. *a.* D. *menisciicarpon*, J. Sm.—Luzon; (*n.* 4.)

*Obs.* I have some doubts of this being a new species, as it appears to answer well to the description of *Polypodium siifolium* of Willd., which Blume has placed in *Aspidium;* and, it is very probable, that *Aspidium menisciicarpon, A. sanctum,* and *A. lineatum* of Blume, are only different states of the same plant: one thing to be said against its being either of these is, that no trace of an indusium is to be found even in very young sori.

52, *p.* 398, *for A. Meyerianum,* read *A. Meyenianum.*

61, *p.* 400, *for a. Guionaros,* read *Guimaros.*

Specimens of the following did not reach me on account of there not being above three specimens of each in the general collection: Nos. 58, 173, 230, 239, 360, 363, 405, 418, and 419.

| | |
|---|---|
| Total number distributed by Mr Cuming, . . | 419 |
| Do. of species according to this enumeration, . . . . . . . . | 297 |
| Presumed new species, . . . . . | 100 |

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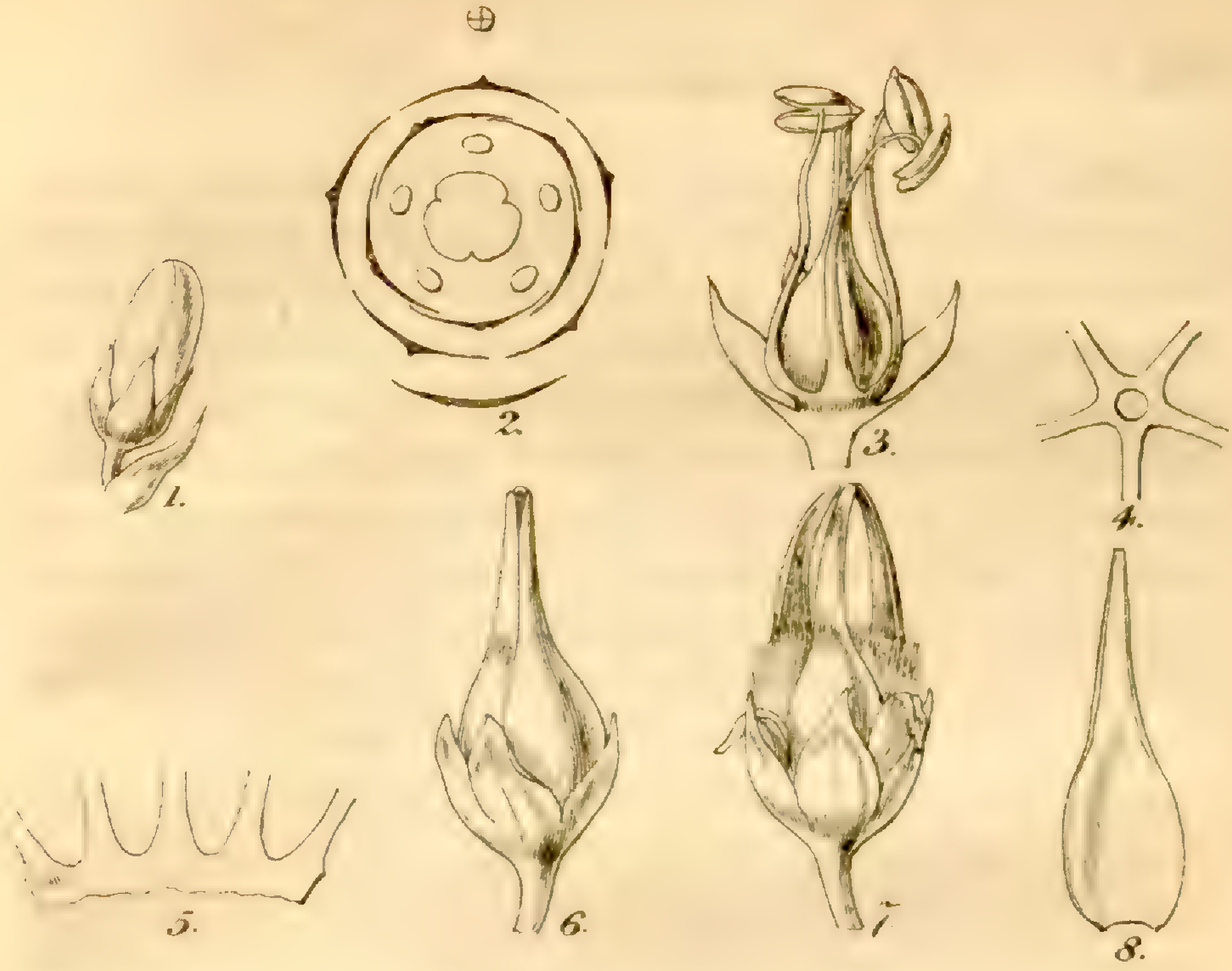
## XXVIII.—Tamarix Gallica *of Linnæus.*

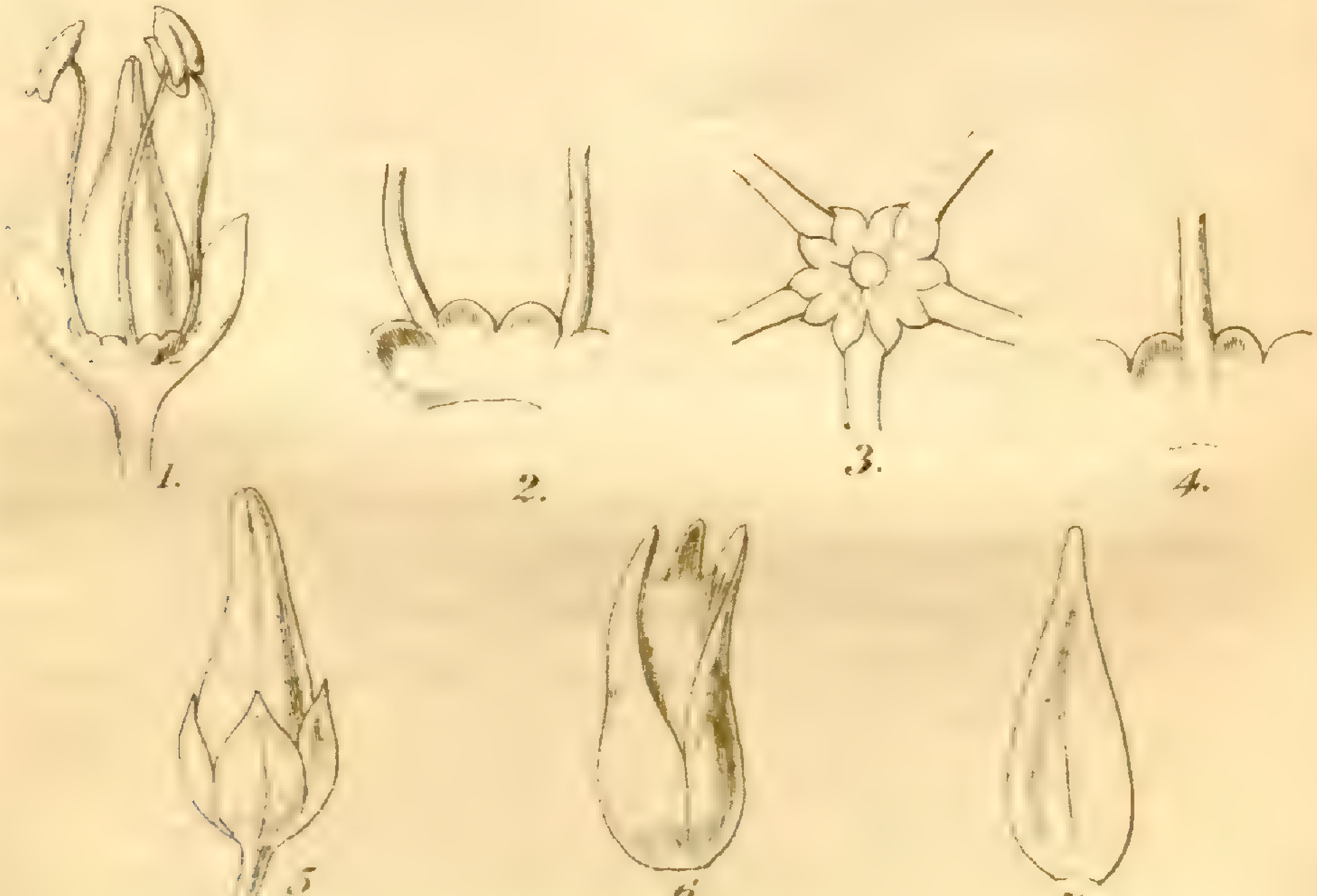
By P. B. Webb, Esq.

[Tab. XV.]

When describing the *Tamarix Canariensis,* Willd., for the *Phytographia Canariensis,* forming part of the *Histoire Naturelle des Iles Canaries,* which I publish in conjunction with M. Berthelot, I was necessarily obliged to take a cursory view of the whole of this intricate genus, and particularly of its European species. I then came to the conclusion that two of these had been confounded under the name of *Tamarix Gallica,* and that the true *T. Gallica,* Linn., was usually found more abundantly on the western coasts of France, whilst much of the Mediterranean form known under that name was to be referred to *T. Canariensis,* Willd. The accompanying plate and descriptions sufficiently prove the existence of



*Tamarix anglica*



*Tamarix gallica Linné*

these two species; I am now however inclined to think that I named them wrongly in that work; subsequent investigations having led me to consider the southern form as the *T. Gallica*, Linn., and that to which I formerly gave this name as an unregistered species confounded with it.

In order to establish this fact, it will be necessary to see what has been previously written concerning these plants, and more particularly as to their hypogynous disk considered as a means of distinction and classification. The older botanists seem to have paid no attention to this organ, and even in later times a most acute observer, M. A. de St Hilaire, in his treatise on the central Placenta, slightly alludes to it only, when treating of the *T. Germanica*, but overlooks it in the *T. Gallica*, (*Ann. Mus.* vol. ii. *p.* 207,) and affirms that the stamens are perigynous.* It was reserved to Professor Ehrenberg in his well-known observations on this family (Linnæa 1827, *p.* 251,) to show its importance, and to call the attention of botanists to its form, in the different species which compose the genus. He considers it as a scutelliform gland, in whose dentated margin the stamens are inserted, so that two of the teeth of the gland like two shafts receive each filament between them. Thus there is a regular proportion between the stamens and the teeth of the gland, the tetrandrous species having eight, the pentandrous ten, and the polyandrous many teeth, and hence are derived the subgenera *Oligadenia*, *Decadenia*, and *Polyadenia*. I am inclined to take a slightly different view of this disk, believing it to be composed of distinct glands or staminodes, analogous in their nature to those of *Crassulaceæ*, the margins of which, united with the bases of the filaments inserted between them, form together a single cupule. The structure of *Trichaurus* (*Trichurus?*) *ericoides*, Wight and Arnott, where the filaments, distinctly visible by

* In this remarkable treatise, M. A. de St Hilaire first established the characters of the group which he calls *Tamaricineæ*, though the name written afterwards *Tamariscineæ*, by M. Desvaux, has been adopted by all subsequent writers. It is clear, however, that it is to the former, and not to M. Desvaux, that the foundation of the order should be attributed.

their colour entirely to their base, alternate with the ten glands which form the disk, confirm this opinion. In further confirmation we find that the floral whorls in the young *Tamarix* are all pentamerous, except the innermost, or pistil, which is composed of three *phyllidia** or ovarian leaves. On examining these (see *fig.* 2,) we perceive that the interior is opposed to the axis of the vegetable, and what is altogether anomalous, to one of the stamens. On the contrary, in the pentamerous *Crassulacea*, the two interior phyllidia alternate with the axis. In *Tamarix*, therefore, it is probable that whilst two of the phyllidia have disappeared, the remaining three have filled up the vacant space, and thus displaced themselves. If however we insert the two that are wanting, one on the side of the axis, and the other in the space opposed to it, the normal position of the whole will be restored, and we shall have a pentamerous flower on the same plan as those of *Crassulaceæ*, the fourth whorl alternating with the stamens, and its two interior members with the axis of the plant, each opposed, as in *Crassulaceæ*, to a staminode, though in this latter case the staminodes are united together in a continuous cupule. This cupule exists in the whole order, and the description of the genus *Myricaria*, by Professor Ehrenberg, *glandula scutellaris germen suffulciens nulla*, is in this respect faulty; the only difference that exists is, that in *Myricaria*, the enlarged bases of the filaments are united above the disk in a tube very distinguishable from the disk itself by its different colour. Hence M. A. de St Hilaire very justly remarks that the lower part of the staminal tube in *Myricaria* is of a glandulous consistence. Nor does the difference in the disks of *T. Africana*, Poir,† and *T. Anglica*, hereafter to be described, in which

* This word from the Greek φυλλίδιον, a *leaflet*, I employ in Latin to express the term ovarian leaves, created by M. A. de St Hilaire, and which represent in the ovarium what are afterwards the valves in the fruit. See *Phytogr. Can. Sect.* i. *p.* 202.

† From having examined an imperfect specimen in which the filament was shrivelled, I advanced most erroneously (*Phytogr. Can. Sect.* i. *p.*

the lobes of the disk seem gradually to pass into the filaments, a conformation which escaped the notice of Professor Ehrenberg, militate against this system, for in reality in these species the teeth exist as in the others; they are merely masked by the enlarged bases of the filaments, as may easily be seen on throwing the light through them by transparence. The same conformation is found in the disk of *Trichurus pycnocephalus*, (*Decaisn. in Jacquem. Voyag. MSS.*); and that species differs from the original *Trichurus*, Wight and Arnott, in this respect, as well as in the indefinite number of its stamens.

The type of the second division of the section *Decadenia* of Professor Ehrenberg, is the *T. Gallica*, taken in a somewhat unusually comprehensive light. Under it are classed nine subspecies or *Hauptvarietaeten*, which are awaiting their future destiny in a sort of limbo,—*animæ quibus altera fato corpora debentur*. It behoves all botanists to hasten their exit from this anomalous state, and aid in translating them to a more permanent abode in the catalogue of nature. Let us therefore pass them in review, and we shall find that some are distinct species, some mere varieties, whilst two only will remain, upon which from want of sufficient data it will be impossible to decide with certainty, namely, *T.* (*Gallica*) *Chinensis*, and *T.* (*Gallica*) *heterophylla*.

*T.* (*Gallica*) *subtilis*, Ehrenb.—Professor Ehrenberg with his usual acuteness perceived that there was a certain difference between a specimen of *T. Gallica* in the herbarium of Willdenow, (*fol.* 1.), and the usual form of the species; and moreover he found, in the herbarium of Von Chamisso, a plant collected at Caen in Normandy, which corresponded with it, and he suspects from this, and from their descriptions, that the English and German botanists have had in view a plant differing either specifically, or as a variety from the southern form. He had however no ripe fruit, nor did he

171), that the disk of *T. Africana*, did not differ from that of *T. Canariensis*, whereas M. M. Decaisne and Spach were perfectly correct in their description of it.

observe the remarkable construction of the hypogynous disk. To this plant he gives the above name, which is inadmissible as a specific denomination; for I have now before me a mass of specimens of this plant sent me in a living state from La Teste near Bordeaux, through the kindness of M. M. Charles des Moulins and Laterrade, and find that slenderness is by no means its usual character; but on the contrary that it has very rarely the younger branches so filiform as those of *T. Gallica*, and that it evidently represents a stouter and less elegant shrub. This is the species I called *T. Gallica*, (*Phytogr. Can. Sect.* i. *p.* 172,) as distinguished from the southern form which I then considered as *T. Canariensis*, Willd. As the epithet *subtilis*, can only apply to some accidental form seen by Professor Ehrenberg, I therefore describe it below under the name of *T. Anglica*.

*T.* (*Gallica*) *Narbonensis*, Ehrenb., *Canariensis*, Willd., *Nilotica*, Ehrenb., *arborea*, Sieb., *mannifera*, Ehrenb.? *heterophylla*, Ehrenb.?

The above forms, excepting perhaps the last two, belong, as was mentioned in the *Phytographia Canariensis*, to the *T. Canariensis*, Willd., which I now consider to be the real *T. Gallica*, Linn., *T.* (*Gallica*) *Chinensis*, Lour.—From a specimen collected in China by Sir George Staunton, the means of examining which I owe to my estimable friend A. B. Lambert, Esq., and which I refer without doubt to *T. Indica*, Roxb., it is possible that the plant of Loureiro may be referrible likewise to that species.

*T.* (*Gallica*) *Indica*, Willd., *T. epacroides*, Smith, *T. Gallica*, W. et Arn.—From specimens given by Klein to Labillardière, I find that the *T. Indica* of Willdenow, and of Roxburgh and his associates, is a very remarkable species easily distinguishable from all others by its very long cylindrical spikes, its campanulate corolla, obovate petals, and truncated disk. The *T. Indica*, Hort. Par. is a different plant, which has since been described by M. Spach under the name of *T. elegans*, in the *Suites à Buffon*, *v.* v. *p.* 482. It is probably a native of northern Asia, as it resists perfectly the Pari-

sian winter, and may have been previously described by the Russian botanists. From its beauty it merits cultivation more than any other species in our temperate zone.

Having thus far cleared the way, I now proceed to describe the two species into which I divide the *T. Gallica* of modern botanists. M. Decaisne in his *Florula Sinaica,* after recording his dissent from the method of uniting so many forms or subspecies under a common type, observes that the disk of *T. mannifera,* and others which correspond perfectly with the section *Decadenia* of Professor Ehrenberg, differ entirely from the *T. Gallica,* and *T. Africana,* in which "se sont les lobes mêmes du disque qui vont en s'attenuant, et forment les filets anthérifères." M. Spach shortly afterwards, in his *Suite à Buffon,* founded his second section on the *T. Gallica* and *Africana,* described as having the disk "non crénelé confondu avec la base élargie des filets." The fact is that the plant cultivated at the Jardin des Plantes under the name of *T. Gallica,* which was studied by both these very accurate observers, came originally without doubt from the western coast, nor did they imagine that two distinct species existed in France under the same name. I followed M. M. Decaisne and Spach in considering in the *Phytographia Canariensis,* this form as the true *T. Gallica,* Linn., and on examining the *T. Canariensis,* I found, on the contrary, that in that species the stamens were inserted in the interval between 5 crenated lobes of the disk, answering to the *glandula germen suffulciens* 10-*dentata,* Ehrenb., and that in this as in other respects it was identical with *T. Senegalensis,* DC., and several other forms. Moreover, I found from specimens collected by myself in the south of France, that the same plant existed there, and I came to the conclusion that the *T. Canariensis* was likewise a French plant. Since then I have examined specimens from every part of the French Mediterranean coast, from the Pyrenées to the Alps, and have invariably found them to belong to this plant, and from others brought from various other localities, I am led to believe that this is the sole *T. Gallica* of the whole Mediter-

ranean basin. On the other hand, from specimens collected on the western coast of France from Bordeaux to the mouth of the Seine, and in England, I find that the other form is alone met with on the shores of the ocean. Which then is the true *T. Gallica* of Linnæus and his predecessors? It is not difficult to answer this question. Pena was the first botanist who described the southern plant since the time of Pliny, who speaks of it, after Dioscorides, under the name of *T. sylvestris*, and we find it figured in the *Adversaria Nova* of Pena and Lobel, under the name of *Tamariscus Narbonensis*. Lobel copied this figure into his *Icones*. Clusius met with this plant in his Spanish journey, and calls it *Myrica sylvestris prima*, to distinguish it from *Myricaria Germanica*, which was his *Myrica sylvestris altera*. C. Bauhin finally admitted it into his *Pinax* after *M. Germanica*, as *T. altera sive Gallica*. Linnæus adopted this name, and cites for his plant Lobel and C. Bauhin. It follows therefore of course that the southern form must be that described by Linnæus as his *T. Gallica*.

The *T. Gallica* is an African species of great geographical expansion, which descends in Senegal to the neighbourhood of the equator, and whose northern limit in southern Europe is about the forty-fifth degree, where, following the usual laws which operate on vegetable growth, it is usually a shrub limited to the milder climate of the coast. In Egypt, according to Sieber and others, and in Fezzan, according to Mr Brown, from the notes of Dr Oudney, it is known under the name of *Attil*, and is the only shady tree.*

The *T. Anglica* is a maritime plant, which seems nowhere to exceed the height of a shrub. Its geographical limits are

* The *T. Orientalis*, Forsk. (*T. articulata*, Vahl. *T. Ægyptia arbor*, C. Bauh.) is said by Prosper Alpinus to be the *Atle* of the Egyptians, written *Atl* by Forsköhl and *Atleh* by Delile, whereas the *T. Gallica* is called *Tarfe* by the Arabs, whence the name *Taray* of the Spaniards, and *Tarajal* of the Canarians. The transposition, however, of the former name to this plant is by no means surprising, as many examples of similar changes are found in other countries.

very narrow, like all those peculiar to the western European zone, links perhaps of a chain interrupted somewhere. It is found on the west coast of England as well as in France, and was first published as *T. Gallica* in Withering's Arrangement, and in Symons's Synopsis.

The following are the specific characters of these two species, and of *T. Africana.*

T. Gallica, *Linn.*; foliis glaberrimis basi latiusculis, floribus in præfloratione globulosis, disco hypogyno 10-gono angulis obtusis brevibus, filamentis inter angulorum dentes insertis, antheris rotundato-cordatis apice longius apiculatis, capsulâ 3-gonâ à basi ad apicem sensim attenuatâ, quasi pyramidatâ.

Μυρίκη ἄγρια, *Dioscorid. Lib.* i. *cap.* 101.

Myrica sylvestris, Plin. *Lib.* 24. *cap.* 9. *Matth.* (*ed. Valgris. Ven.* 1570) *p.* 125.

Tamariscus Narbonensis, *Penna et Lobel. Advers.* (*edit. Antwerp,*) *p.* 447. *Lobel Ic. p.* 218.

Myrica Sylvestris I. *Clus. Rar. Stirp. Hisp. p.* 105.

Tamarix altera folio tenuiore sive gallicâ. *C. Bauh. Pin. p.* 485.

Tamarix Gallica, *Linn. Sp. pl.* vol. i. *p.* 387. *Sibth. Fl. Græc. tab.* 291. *Brown It. Oudn. Denh. et Clapp. App. p.* 28.

Tamarix Canariensis, *Willd. Act. Ac. Ber.* 1812-13. (*edit.* 1816,) *p.* 77. (*D.C.*) *Link in Buch Beschr. Can. Ins. p.* 155. *D.C. Prod.* vol. iii. *p.* 96. *Webb et Berth. Phyt. Can. Sect.* i. *p.* 171, *tab.* 25.

Tamarix Gallica arborea. *Sieb. ex sicc!*

Tamarix Senegalensis. *D.C. Prod.* vol. iii. *p.* 96. *Guill. et Perrott. Fl. Seneg.* vol. i. *p.* 309! *Brunner. Bot. Ergebn. in Bot. Zeit. Beiblætt.* 1840. 2. *Band. p.* 23.

T. (Gallica) Narbonensis, Canariensis, Nilotica, arborea. *Ehrenb. Linnæa,* 1827, *p.* 267. *et seq.*

*Frutex* aut arbuscula 10—30-pedalis, ramosissimus, ramis rectis, virgatis, patentibus, cortice lævi purpurascente. *Folia* lanceolata, aut ovato-lanceolata, basi latiora, acuta, glaucescentia. *Racemi* erecto-patentes, cylindracei, graciles, densè

floriferi. *Flores* in alabastro globulosi, brevissime pedicellati, pedicellis strictis. *Bracteæ* ovato-lanceolatæ, aut lanceolatæ, basi latiusculæ, pedicello longiores. *Calyx* campanulato-patens ad medium usque 5-fissus, laciniis ovatis, acutiusculis margine scariosis. *Petala* carnea, ovata, obtusa, concava. *Stamina* corollâ longiora. *Filamenta* filiformia, rosea. *Antheræ* subrotundæ, apiculatæ. *Ovarium* pyramidatum basi subrotundatum. *Capsula* pyramidata, angulis acutiusculis. *Coma* seminum capsulæ valvulis subbrevior.

T. Anglica; foliis glaberrimis basi subangustatis, floribus in præfloratione ovatis, disco hypogyno 5-gono angulis acutis lobulorum apicibus in filamenta basi attenuatis, antheris ovatis breviter apiculatis basi divergentibus, capsulâ basi rotundato-3-gonâ apicem versùs abruptè angustatâ quasi lagenæformi.

T. Gallica. *Sym. Syn. Pl. Brit. p.* 77. *Wither. Arr.* vol. i. *p.* 318. *Smith, Fl. Brit. vol.* i. *p.* 338. *Engl. Bot. tab.* 1318, *Engl. Flor.* vol. ii. *p.* 111. *Lamck. Ill. tab.* 213., *fig.* 1. *Poir. Encycl.* vol. vii. *p.* 520. *D.C. Fl. Fr.* vol. iv. *p.* 399., quoad stirpem occidentalem (excl. synonym. omnibus.)

T. (Gallica) subtilis. *Ehrenb. Linnæa,* 1827, *p.* 267.

*Frutex* 4—10-pedalis, ramosus, ramis erectiusculis, crassis, subvirgatis, cortice lævi purpurascente. *Folia* lanceolata, viridia, glaberrima, acuta, margine submembranacea. *Racemi* erecto-patentes aut erectiusculi, cylindraceo-subquadrati, laxiusculi. *Flores* in alabastro ovati, breviter pedicellati, bracteis lineari-lanceolatis, margine scariosis, acutis. *Petala* albida, extùs dilutè rosea, ovato-lanceolata, concava, obtusa, per anthesin patentia. *Stamina* petalis plus duplò longiora. *Filamenta* filiformia, albida, in alabastro, et deflorata, contorta, per anthesin recta, patentia. *Antheræ* purpureæ, ovatæ, apice rotundatæ apiculatæ, sacculis basi divergentibus. *Discus hypogynus* fusco-purpureus. *Ovarium* lagæniforme, basi rotundatum, albidum, demum post anthesin roseum. *Coma* seminum capsulæ valvulis brevior.

T. Africana, *Poir.;* foliis glaberrimis margine subscariosis divergentibus, floribus magnis ovatis, disco hypogyno 5-

Hewardia adiantoides.

gono dentibus staminum basibus confluentibus, antheris muticis, capsulâ brevi ovato-3-gonâ, valvis ovato-lanceolatis.

*Description of the Plate, Tab. XV.*

*T. Anglica.* 1. Flower bud with its bracte. 2. Plan of the flower, showing the position of the organs with regard to the axis of the plant. 3. Section of the flower showing the stamens forming a continuous body with the hypogynous disk, which embraces the base of the ovarium. 4. The disk separated from the flower with the base of the truncated stamens. 5. The same cut open, and artificially expanded. 6. The ripe capsule. 7. The same at the moment it dehisces, showing the relative length of the coma of the seed. 8. A valve separate.

*T. Gallica,* Linn. 1. The flower deprived of the corolla, and a portion of the calyx, to show the hypogynous disk embracing the base of the ovarium. 2. Section of the same, more highly magnified, showing the insertion of the stamens. 3. The disk apart with the bases of the filaments. 4. Section of the same expanded and highly magnified, to show by transparence, the true base of the filament. 5. The capsule surrounded by the persistent calyx. 6. The same separated from the calyx at the moment of its dehiscence, to show the relative length of the coma of the seed. 7. A valve separate. All the figures are *magnified.*

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## XXIX.—*On* HEWARDIA, *a new genus of* FERNS. *By* Mr JOHN SMITH, F.L.S.

(TABS. XVI. XVII.)

(I RECEIVED the following communication respecting this new genus of Ferns from Mr Smith in a letter dated, Royal Botanical Garden, Kew, September 28th, 1840. Finding that I could sooner give it publicity in my *Journal of Botany* than in my *Genera Filicum,* I resolved to give a figure with Mr Smith's description in this work; and the generic distinc-

tions will also be given in the *Genera Filicum*, Part IX., for which the plates are now in preparation.—Ed.)

In my paper on the Genera of Ferns, laid before the Linnæan Society, I have constituted a new genus, founded upon a remarkable, and I believe, very rare Fern, of which I have seen only one specimen that has been kindly presented to me by Mr Lambert, into whose possession it came by the purchase of the celebrated collection made by Martin in French Guiana. I have enclosed you a sketch of my specimen, as also a portion of one of the pinnæ, and I should be glad if you thought it worthy of being published in the *Genera Filicum.* My reason for so asking is, on account of its not being yet described, (to my knowledge) and of my having dedicated it to my friend, Mr Robert Heward, F.L.S. I have been induced to do so in consequence of the very great attention bestowed by him on the Ferns while residing in Jamaica, and subsequently of his having materially assisted me in determining many of the doubtful West India species. I characterize it as follows:—

Hewardia, *J. Sm., mst. in Linn. Soc. Trans.*

*Indusium* marginal, continuous, attached exteriorly, venose and sporangiferous on its underside; at length replicate, forming a continuous marginal *sorus. Veins* superficial, reticulated, all the venules anastomosing and forming elongated areoles.—Fronds *from* 1½ *to* 2 *feet high? stipitate and dichotomous, ebeneous.* Pinnæ *pinnate; pinnules membranaceous, ovate-lanceolate, oblique at the base,* 4 *to* 5 *inches long by* 2 *inches wide, alternate and petiolated, persistent,* (*not articulated and deciduous as in* Adiantum;) midrib *becoming obsolete towards the apex of the pinna.*

Hewardia *adiantoides.* (Tab. XVI.—XVII.) *J. Sm. mst. in Linn. Soc. Trans.*

Hab. Guiana. *Martin, ex Herb. Lambert.*

*Obs.*—In habit and aspect this hitherto undescribed Fern approaches the largest forms of *Adiantum* and *Schizoloma,* agreeing with the first in the sporangia being produced on

the indusium, and with the latter by the reticulated venation, so that *Hewardia* bears the same relationship to *Adiantum* that *Schizoloma* does to *Lindsæa*. The reticulated veins of *Hewardia* and *Schizoloma* readily distinguish these two Genera from *Adiantum* and *Lindsæa*, in which the veins are all free.

J. SMITH.

TABS. XVI. XVII. *Hewardia adiantoides.* Portion of a plant; *nat. size;* from a sketch by Mr J. Smith. *f.* 2. Portion of a pinna. *f.* 3. Sporangia *magnified.*

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XXX.—*Remarks on* DRUMMOND'S MUSCI AMERICANI, *collected in British North America, during the second Land Arctic Expedition, under the command of* SIR JOHN FRANKLIN, R. N.—*Glasgow*, 1828.—*By* W. WILSON, ESQ., *Warrington.*

No. 6. Phascum *cuspidatum, var. elatum*—In all the copies of this publication which have come under the notice of the writer, the specimens given are not distinguishable from the ordinary state of *Phascum cuspidatum.*

9. *P. subexsertum.*—Perhaps only a remarkable variety of the species above named.

12. Gymnostomum *phascoides.*—Perhaps this Moss, together with several species of *Hymenostomum*, enumerated in Bridel, *Br. Univ.*, are only varieties of *Gymnost. microstomum*, differing merely, and that in a very slight degree, in the length of the seta and the shape of the capsule.

16. G. *latifolium.*—Compare G. (*Physcomitrium*) *Bonplandii*, Hook., which, however, is described with a plane operculum. The seta varies much in length, in some specimens one-fourth of an inch.

19. G. *subsessile.*—The calyptra of this Moss is certainly different from what is usually found in *G. ovatum*, with which it has much affinity, especially in the remarkable structure of

the leaf. Perhaps No. 18, which has its leaves differently marked, as to the reticulation, which is dotted, may also prove to be distinct.

21. G. *tenue.*—This may be *G. calcareum*, Bridel, *Br. Univ. vol.* i. *p.* 65.—A solitary specimen examined had the operculum conico-subulate, two-thirds the length of the capsule.

22. G. *pusillum.*—The writer is disposed to unite this with *G. Donianum*, as a dwarf variety.

23. G. *tortile.*—All the specimens seen correspond very nearly with No. 24, *G. rupestre*, between which and No. 21, it is nearly intermediate. It is certainly not G. *tortile*, Schwaegr.

26. G. *curvirostrum, var. minor.*—This agrees well with the description of *G. microcarpon*, Hornsch. *in Bridel, Br. Univ. vol.* i. *p.* 81, and may perhaps be distinct from G. *curvirostrum.*

32. Splachnum *rubrum.*—Careful dissection of the apophysis does not confirm the account given of its shape, which is by no means spherical. It is probably disciform in an early stage, becoming, as the capsule ripens, umbraculiform; its diameter is at least six times greater than its length.

33. S. *luteum.*—Not distinct from the last, having serrated leaves, although given as entire in Hedwig's figure.

35. S. *sphæricum.*—This has the leaves of *S. ampullaceum*, and may perhaps be a variety of that species, if it be not *S. serratum*, Hedw. *Sp. M. t.* 8.

37. S. *heterophyllum.*—In many respects this Moss very much resembles *S. vasculosum*, of which it may be a local variety, having a smaller apophysis.

38. S. *urceolatum*, 39, S. *intermedium*, and 40, S. *mnioides.*—Concerning the first of these Bridel very justly remarks as follows:—"Præcedenti (*S. mnioid.*) simillimum nec limitibus satis certis ab eo separatum."—An intermediate species must therefore be exceedingly difficult to identify. Indeed *S. intermedium* has the leaves very much more like *S. sphæricum* than like either of the species with which it is associated.

43. S. *arcticum.*—Too much like *S. mnioides*, of which it is probably a variety.

46. Systylium *splachnoides.*—Specimens of No. 44, *Splachnum Frœlichianum*, are in some cases substituted: they are indeed very nearly allied; the peristome of *Systylium* is red, consisting of sixteen geminate or lacunose teeth; that of *Splachnum Frœlichianum* is pale, of eight pairs of teeth much wider at the base.

48. Encalypta *streptocarpa*—different from the British species so called.—It is very probably *E. procera*, Bruch and Schimper, *Bryol. Eur. Fasc.* 4. *t.* 8. Peristome double. Base of the calyptra laciniated and inflexed as in *E. ciliata.* Leaves with recurved and somewhat revolute margins, sometimes also with a piliferous apex. Some of the specimens have the capsule with straight furrows, and in all the capsule is less twisted than in *E. streptocarpa.*

49. E. *affinis*, (*E. commutata.* Bruch and Schimper, *Bryol. Eur. Fasc.* 4. *t.* 1.)—There is no peristome in this Moss, which is certainly distinct from *E. ciliata.*

52. E. *rhaptocarpa*, var.—The obtuse leaves and absence of peristome seem to indicate a distinct species; but the specimens are imperfect.

57. Grimmia *atrata.*—In the supplement to *Eng. Bot.* the writer has described and distinguished *G. unicolor* and *G. atrata.* The specimens before us belong to *G. unicolor* of Hook. and Taylor, *Musc. Brit. Suppl. t.* 3.—not to Hook. *Musc. Exot. t.* 100.—It may, however, be *G. atrata* of Schwaegr. *Suppl. t.* 116.

60. G. *calyptrata.*—Intermediate between *G. ovata*, No. 59, and *G. Pennsylvanica*, No. 56.

61. G. *Hookeri.*—Not distinct from *G. Muhlenbergii*, Brid. (*G. incurva*, Muhlenb.)

64. Weissia *turbinata.*—Not sufficiently distinct from *W. splachnoides.*

66. W. *Seligeri.*—The Moss here given has the seta bent when wet, and appears to be only a blunt leaved variety of *W. recurvata.*

74. W. *macrocarpa*, nov. sp.—This is most probably *Weissia elongata*, Hook. *Musc. Exot. t.* 102., which seems not to be truly distinct from *W. Mielichoferi*, Schwaegr. *Suppl.* ii. 1. *p.* 47. *t.* 114.

75. Pterogonium *intricatum*, Hedw.—The greater part of the specimens belong to *Pterogonium ascendens*, Schwaegr. *Suppl. t.* 242. *a*, but the peristome is certainly that of *Neckera*, and the Moss may be only one of the American forms of *Neckera sericea*, perhaps the same as the one called *Pt. Carolinianum*, Bridel, *Br. Univ. vol.* ii. *p.* 184. It comes very near to No. 159 of this series. Some of the specimens given for *P. intricatum* belong to *Leskea polyanthos*, a Moss very nearly allied, and scarcely distinguishable, except by an attentive examination of the peristome.

76. P. *intricatum, var. laxum.*—Certainly *P. subcapillatum*, Hedw. *Sp. M. t.* 16, having a scabrous seta.

80. Dicranum *scoparium*.—Some, if not most, of the specimens are probably varieties of *D. Schraderi*; (compare No. 87.)

82. D. *fuscescens*.—The specimens probably belong to *D. congestum*, Schwaegr. *t.* 42. The same Moss is found in Scotland.

84. D. *Starkii, var. major*.—These specimens appear to be also *D. congestum*, Schwaegr.; the capsule is destitute of struma, and the leaves are serrated.

86. D. *undulatum, var.*—Probably a distinct species.

88. D. *Schraderi, var. major*.—These specimens appear to belong to the typical form, well represented in Schwaegr. *Suppl. t.* 41.

91. D. *elongatum*.—It is difficult to distinguish any of the specimens here given from *D. strictum*, No. 81, and some of them are exactly similar. If there be any real difference it will be found in the rather shorter and inclined capsule of *D. elongatum*, and in the foliage, which is very erect and almost appressed to the stem when wet, and slightly crisped in a dry state.

92. D. *elongatum, var. minor*.—No observable difference between this and *D. strictum*.

97. D. *Schreberianum.*—This is the var. $\beta$. *Grevilleanum* of Bridel, *Br. Univ. vol.* i. *p.* 450: it is probably a distinct species.

102. D. *Scottianum.*—Certainly different from the British Moss so called. The specimens very much resemble some of the varieties of *D. polycarpum*, and may belong to *D. montanum*, Hedw. *Sp. M. t.* 35.

104. D. *Richardsoni.*—This appears to be *Oncophorus Wahlenbergii*, Bridel, *Br. Univ. vol.* i. *p.* 400, (*D. virens*, Wahlenb.)

114. Didymodon *oblongifolium.*—Exceedingly like *Dicranum latifolium*, No. 109, and perhaps only a state of the same Moss.

115. D. *latifolium*, and 135, Tortula *bryoides*, nov. sp.—These are probably one and the same species. They are closely allied also to *D. oblongifolium*, and to *Dicranum latifolium.* It is even somewhat doubtful whether *Weissia latifolia*, No. 70, may not be the same species under another phasis.

127. D. *fragile*, nov. sp.—The teeth of a broken peristome examined were evidently inclined as in *Tortula*, to which genus it perhaps belongs.

137. Tortula *humilis.*—None of the specimens agree well with Hedwig's figure, *Sp. M. t.* 25, and some of them must be referred to *Didymodon oblongifolium*, No. 114.

138. T. *convoluta.*—The best figure of this Moss is given in Hedwig, *Musc. Frond. v.* i. *t.* 32, where the leaves are correctly represented as oblong and obtuse: they are often described as lanceolate and acute.

139. T. *fallax.*—Probably Bridel's *var.* $\gamma$. *reflexa*, "foliis minoribus siccitate non tortilibus," and extremely near to *Barbula gracilis*, Schwaegr. *Suppl. t.* 34.

145. T. *suberecta*, nov. sp.—Inconveniently near (as a species) to *T. bryoides*, No. 135. The peristome is, however, more decidedly that of a *Tortula*.

158. Orthotrichum *speciosum.*—Most of the specimens are correctly named; but in one instance *O. pulchellum* was found mixed with this species.

161. Neckera *pennata*.—In one of the sets a *Neckera*, probably new, allied to *N. Douglasii*, Hook. *Bot. Misc. v.* i. *t.* 35, was found in company with this species. The new species is smaller than *N. Douglasii*, in habit resembling *N. exserta*.

164. Hypnum *denticulatum*.—The specimens given have the margins of the leaves evidently reflexed, so as to give the appearance of a border; this feature has not been observed in British specimens: it may perhaps be found in *H. sylvaticum* which these specimens very much resemble.

165. H. *denticulatum, var. Donianum*.—More like the common state of *H. denticulatum*. Its leaves are certainly acute. In one of the copies there was found substituted for this Moss a beautiful *Leskea*, with ovate concave cirrhose leaves: it is probably *Leskea flaccida* of Torrey. (See Bridel, *Bryol. Univ. p.* ii. 308.)

166. H. *vagans*, nov. sp.—The specimens given have a *scabrous seta*, and are much like *H. rutabulum*, of which it may be a variety, perhaps *var.* ξ. *explanatum*, of Bridel, *Bryol. Univ. v.* ii. *p.* 488.

168. H. *Silesianum*.—Some of the specimens seem to be correctly named, but several of them belong to *H. pulchellum*, having perfectly entire leaves.

169. H. *sericeum*.—The substriated leaves rather indicate that this Moss is allied to *Leskea imbricatula*, Hedw. *Sp. M. t.* 52.

174. H. *lutescens*.—Certainly not that species. It is probably the same as No. 169, or perhaps a variety of *Leskea acuminata*, Hedw. *Sp. M. t.* 56.

176. H. *populeum*.—If *H. reflexum* be considered a distinct species, these specimens probably belong to that, having broader leaves than *H. populeum*.

178. H. *rutabulum*.— This may be *H. chrysostomum*, Schwaegr. *Suppl. I.* ii. *p.* 276, but it is probably only a variety of *H. rutabulum*.

180. H. *pulchrum*.—This is *H. curvirostrum*, Bridel, *Br. Univ. v.* ii. *p.* 482. It has also been called *H. Cooleyanum*, Torrey *in lit.*

183. H. *strigosum*.—Some of the specimens resemble *Leskea fasciculosa*, Hedw. *Sp. M. t.* 54. *H. pulchellum*, Hedw. *Sp. M. t.* 68, does not agree well with any.

188. H. *serpens, var. compactum*.—A very distinct, perhaps new species, having the leaves serrulate with a strong percurrent nerve. Capsule erect. Peristome nearly that of *Leskea*, having the ciliæ of the inner fringe very minute.

192. H. *illecebrum*, Hedw.—This is *H. Boscii*, Schwaegr. *Suppl. I.* ii. *p.* 203.

196. H. *amœnum*.—Not of Hedwig, *Sp. M. t.* 77. Probably a variety of *H. cupressiforme*.

204. H. *fluitans, var.*—The ovate leaves are very unlike those of *H. fluitans;* they are also wider in proportion than those of *H. riparium:* from both of these the Moss here given is probably distinct. It has some resemblance to *H. orthocladon*, as also to *H. inordinatum*, and *H. pachypoma*, Schwaegr. *Suppl. t.* 287.

206. H. *cupressiforme, var.*—This may be distinct: the margin of the leaf is much recurved. Compare *H. reptile*, Bridel.

207. H. *cupressiforme, var.*—Compare *H. recurvans*. This also has the margin of the leaf recurved and serrulate. Some of the specimens belong to *H. imponens*, Hedw.

211. H. *trifarium*.—The specimens are more like *H. molle;* leaves faintly 2-nerved at the base.

214. H. *proliferum, var. compactum*.—The specimens are not all uniform, some of them belonging to the next species, *H. Blandovii*, No. 215. Those intended to be given under this name are very interesting, because they agree well with *H. recognitum*, Hedw. *Musc. Frond. v.* iv. *t.* 35, having the conical operculum expressive of that species. It has a somewhat different aspect from *H. proliferum*, No. 213, and may be truly distinct.

217. H. *abietinum, var.*—Probably *H. varium*, Bridel.

219. H. *catenulatum*.—Certainly a distinct species. In a moist state this Moss is remarkable for its strongly aromatic scent resembling the plant called Fœnugreek.

220. H. *moniliforme.*—The peristome is that of a *Leskea.*

224. H. *erectum,* nov. sp.—This is most probably *Leskea acuminata,* Hedw. *Sp. M. t.* 56.

225. H. *tenax,* not of Hedwig, but a true *Leskea,* with a short erect capsule; it is perhaps an undescribed species.

232. Fontinalis *antipyretica.*—This a large var. of *F. squamosa.*

233. F. *squamosa.*—The specimens here given have sharply connate leaves, and must therefore be referred to *F. antipyretica.*

234. F. *capillacea.*—Certainly not that species, but *F. falcata,* Hedw. *Musc. Frond. v.* iii. *t.* 24.—Leaves linear-lanceolate, carinate, the nerve ceasing below the apex.—Perichætial leaves extending beyond the base of the capsule.

236. Funaria *Muhlenbergii.*—The specimens here given are considerably unlike the British Moss so called, having the leaves spreading and much narrower, like those of *Entosthodon Templetoni,* which the Moss now under consideration greatly resembles. It comes nearest to *F. Fontanesii* of any described species, but the leaves are very much acuminated.

244. Bryum *triquetrum.*—Possibly two species may have been here confounded; at least, some of the specimens present a very singular structure of the peristome, not easily described in words: the outer peristome is united to the inner in such a manner that there are seen, in a section of the whole peristome, a series of elliptical spaces formed apparently by the revolute margins of the outer teeth being so much bent as to be in contact. In other specimens the outer teeth are perfectly free and of the usual shape.

249. B. *dealbatum.*—This species usually described as having serrated leaves, has them entire in all the numerous specimens examined, both British and foreign.

257. B. *spinosum.*—Some of the specimens are probably correctly named, having the leaf broadly elliptical, the border cartilaginous and beset with a double row of spinules, as in *B. marginatum,* No. 259. Other specimens belong to *B. affine.*

260. B. *carneum* is *B. albicans:* the capsule of this Moss has no annulus.

262. B. *nutans.*—Some of the specimens are much smaller than the rest, and belong probably to *B. annotinum*, Hedw.

263. B. *nutans, var. minor.*—The Moss here given is far more nearly allied to *B. albicans*, No. 260, with which it agrees in having no annulus. It has however the appearance of a distinct species.

270. B. *elongatum.*—None of the specimens are very expressive: some resemble *B. crudum*, No. 269, and may be only varieties of that species.

283. Polytrichum *sexangulare.*—Bridel, *Br. Univ. v.* ii. *p.* 132, calls this Moss *P. sexangulare*, and says that *P. septentrionale*, Swartz, is only a var. of *P. alpinum.*

284. P. *urnigerum.*—The specimens all agree with the British Moss so called: (compare *P. capillare*, Schwaegr. *Suppl. I.* ii. *p.* 318.)

285. P. *angustatum.*—The specimens are doubtless correctly named. The original specimen, from which the figures are given in Hooker's *Musc. Exot. t.* 50, has the operculum broken; hence the figure is so far incorrect as a representation of the species. The reticulation of the leaf is more minute than in *P. undulatum*, yet varieties occur which can with difficulty be referred to either of the estimated species.

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## XXXI.—BOTANICAL INFORMATION.

### *Latest Information from* MR GARDNER.

RIO DE JANEIRO, *Dec.* 18*th*, 1840.

* * * Shortly after my arrival in Rio, I wrote you a few lines to inform you that I had at last happily terminated the journey on which I have been so long engaged. I have now to inform you that I have just shipped on board a vessel bound for London, three boxes of plants, two of which contain 527 species of dried plants, which I send to Pamplin for distribution among my subscribers; and the other with

living plants for Mr Murray. The dried plants are those which I collected in the south of the province of Piauhy, and in the district of the Rio Preto. I am just now occupied on those from the Mission of Duco and Natividade, which I believe will amount to about other five hundred species. These will go by the next London ship. Then I will take up the Arrayas ones, and so on till I get them all despatched.
* * * * I lately found near where I live, a few fine specimens in fruit of Zuccarini's new genus *Carpotrochus*, which you perhaps have not got, as it is rather rare, at least the ♀ plant is. I also live in the neighbourhood of Dr Ildefonso Gomez, who accompanied St Hilaire on his first journey up into Minas. I have received much attention and kindness from him. He is well acquainted with the botany of this province. It will be the end of next month before I can get rid of my collections from the interior, and then I propose to spend a week or two on the Organ Mountains, and make a journey to the higher levels of them, and remain five or six days. I am sure that I shall be rewarded. My great object will be to get living plants to take home with me. I should like to introduce the *Prepusa* alive, and I dare say that it will not be a difficult task. Riedel tells me that when Guillemin was here, he attempted to go up to the top of the Organ Mountains, but that he did not go so far as I did, and that owing to the bad state of the weather, he was very unsuccessful in his collecting. I intend also to visit the Restingas of Cape Frio, the place where St Hilaire says he found such a rich harvest of fine plants. It is about a degree to the eastward of Rio; a steam-boat calls there once every ten days, so that it will be both easy to go and to return. Riedel has promised to accompany me, and he has a friend there who has a salt work, at whose house we can remain. Believe me ever to be,

My Dear Sir,

Your most obedt. and grateful Servant,

George Gardner.

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